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AMIGA Hard Disk Drives *An Introduction*

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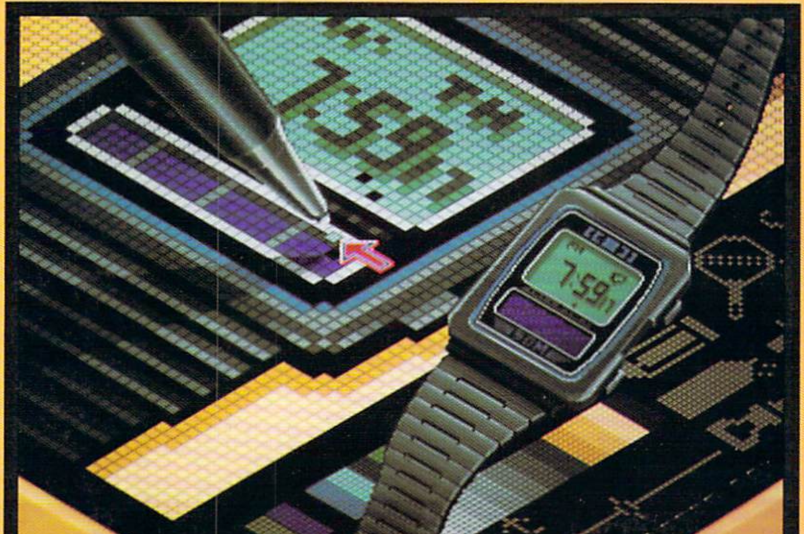
Installing an AMIGA Hard Disk Drive

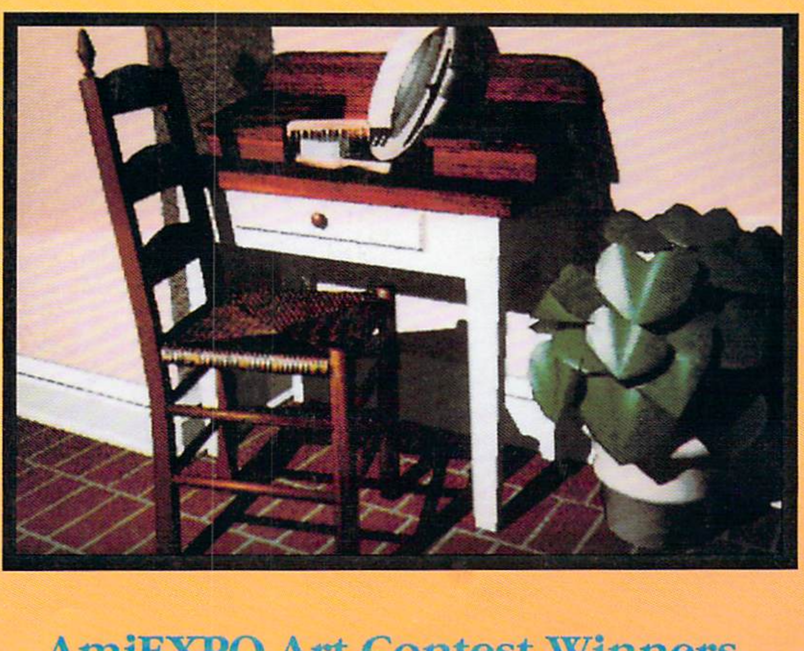


Programming:

MultiSORT
Arguments in AmigaBASIC
Shared Libraries

Snapshot:

(New game review column)
Virus
SpaceCutter
World Tour Golf



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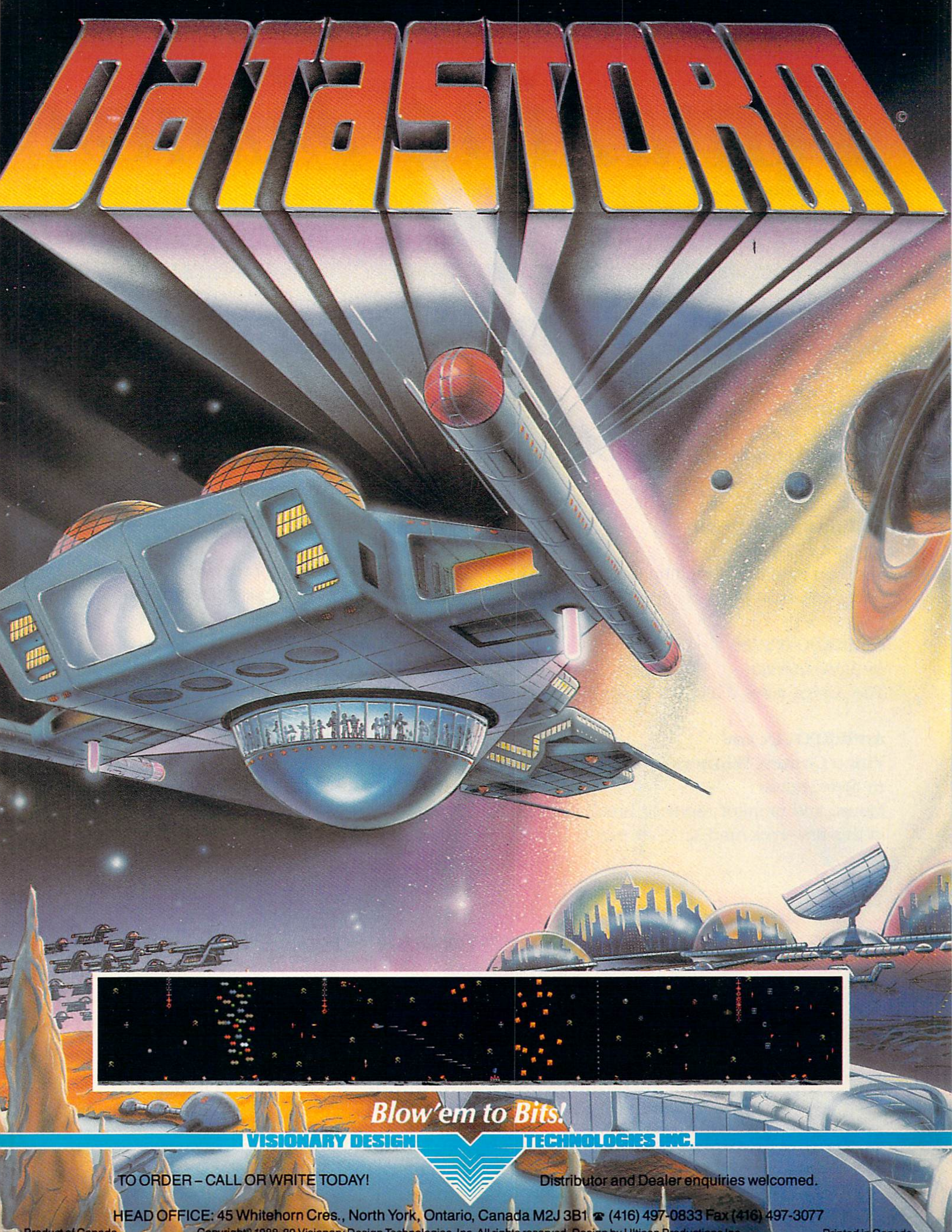
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SPECIAL THANKS TO:
Buddy Terrell & Byrd Press
Bob at Riverside Art, Ltd.
Swansea One Hour Photo

Amazing Computing™ (**ISSN 0886-9480**) is published monthly by PiM Publications, Inc., Currant Road, P.O. Box 869, Fall River, MA 02722-0869.

Subscriptions in the U.S., 12 issues for **$24.00**; in Canada & Mexico surface, **$36.00**; foreign surface for **$44.00**.

Second-Class Postage paid at Fall River, MA 02722 and additional mailing offices.

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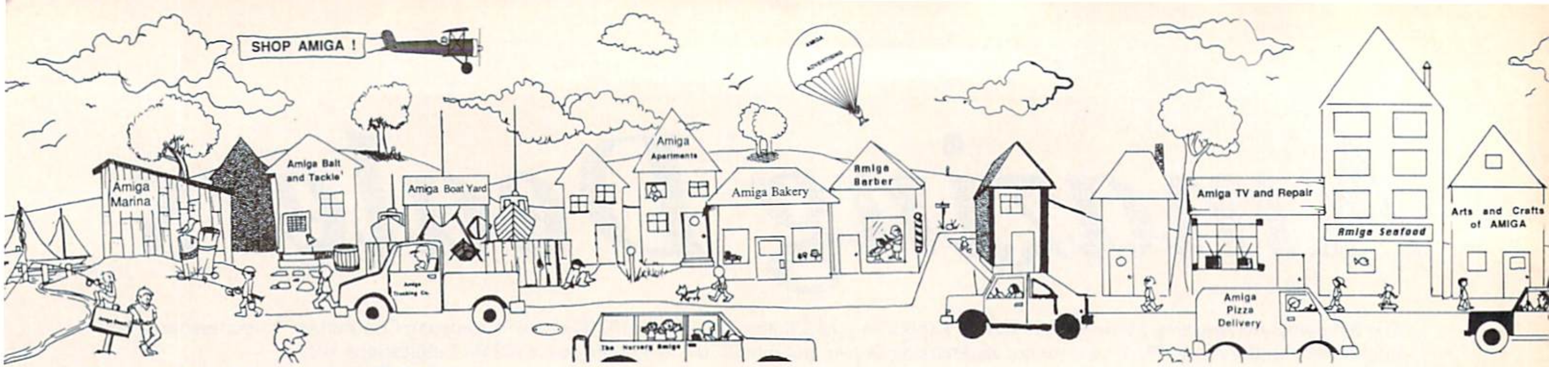

From The Managing Editor

A NEW LOGO!
Well, Amazing Computing has changed its look, at least a little. Though the alteration on our front cover may appear slight, it nonetheless represents a remarkable amount of discussion, frustration, and disbelief.

Some of you must be wondering, "Why the change?". Others might be wondering why it took us so long to add "AMIGA" to our title. There are, of course, those who might just be asking, "Who cares?"

Changing or altering the title of a publication that is enjoyed and read by so many Amiga users is not an easy thing to do. We are continually concerned that our readers may interpret any change as an abandonment of our traditional goals. This is hardly the case. While we will continue to grow, we will never change those things which have made Amazing Computing your favorite Amiga magazine.

AC was built upon two basic policies:

1. To provide Amiga users with a tool with which to learn and do more with their machines by establishing an expanding reference to the Amiga and its capabilities.

   No one can fault Amazing Computing on these efforts. AC has provided increasing amounts of editorial content. Each issue of AC is decidedly larger than any of our competitors'. Our articles continue to be full length. We always ask that our authors take as much time as they need to "tell their tale." We never specify constraining page limits, preferring instead that our authors include as much of their expertise as possible.

2. To put the amazement back into computing. When Commodore introduced the Amiga, it was the first machine we had seen in a long time that users could get excited about in such dramatically new directions. Not only could the Amiga do everything the other computers could, but it could do it faster, in color, and, via multitasking, it could do more than one thing at a time. We have taken a bit of teasing for using the word "amazing" in our title. However, amazing remains the best adjective to describe the Amiga.

   Our continued goal is to bring this amazement to each reader. We have accomplished this in part by allowing our authors to select articles and reviews according to their interests. Rarely does AC's editorial staff direct or assign topics. We want our authors to be fully committed to the topic of their choice and, in the process, pass their excitement on to the reader.

So why change? We want to be more easily recognizable to the general public. We want to reach more Amiga users. We want the public to realize the full capabilities of this machine.

So what is the problem? Commodore.

AMIGA as seen by Commodore
Since the Amiga was launched Commodore Business Machines has maintained complete control of the "AMIGA" trademark. Any new developers who wished to use the word "Amiga" in the title of their new product were quickly instructed to find another title. The obvious exception was "AmigaWorld", published by IDG Communications. From conversations we have had with both IDG and Commodore executives, IDG was granted the use of the trademarked name AMIGA under the condition that they would provide a magazine in time for the Amiga's debut. AmigaWorld's first issue was on time. Therefore, they earned the right to the title.

IDG Communications took an incredible gamble in releasing a publication for a computer which was not even in full production. Yet, they were convinced of the Amiga's ability and IDG gained advanced placement in the market as sole contender to a large group of computer enthusiasts anxious to know more about this new computer from Commodore. IDG stood alone for some time as the only third party supplier with anything to sell to the Amiga market.

AC published its first issue some six months later. Although AmigaWorld was certainly a very pretty publication, we did not believe it was catering to the majority of Amiga users. AmigaWorld was not providing what these users needed or wanted—information. The immediate acceptance of AC by the Amiga community was proof that we were on the right track.

We would have included AMIGA in our title had we received an OK from Commodore. However, we were told early on in our preparation that AMIGA was not to be licensed or franchised to any additional third parties. No one else would ever be given the right to use AMIGA in their titles.

Since then, we have seen software and hardware developers continually be turned down by CBM in their requests and, until now, we were quite content to continue our work under these constraints. However, things change.

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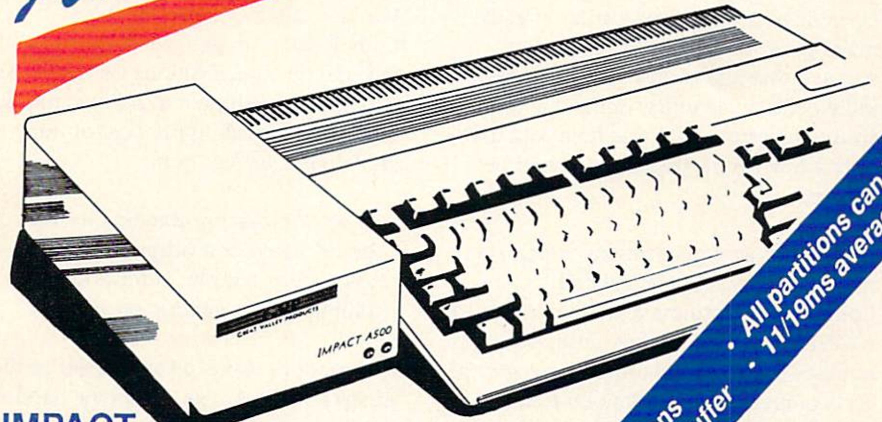

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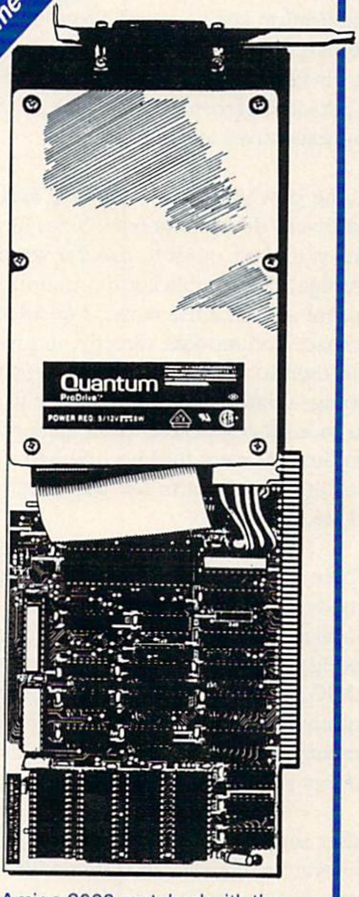

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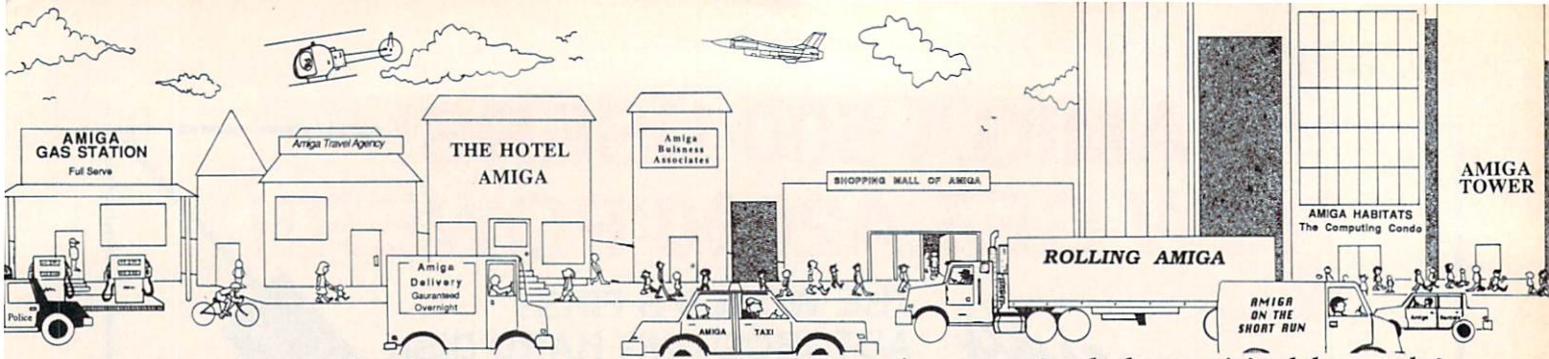

Newsletters and even small publications began appearing with AMIGA in their title. We watched, wondering when Commodore would step in and safeguard their right. Nothing happened. When I spoke with an editor from a small publication last year and asked him how he had obtained the right to put AMIGA in his title, he chuckled and said he had a personal agreement with one of the top executives at Commodore.

In the past year, more software and hardware developers have been turned down in their quest to use the word "Amiga". Still, publications continue to sprout and take the name. I decided to contact Commodore directly, requesting the right to do what everyone else was doing—place AMIGA in our title to make us more recognizable to the general public. We were told no one had acquired the right to use the trademarked name.

There must be some mistake. Sitting on my desk were no less than four US publications as well as a larger group of foreign publications and newsletters with AMIGA in their title. Meanwhile, I was informed that the executive in charge of trademarks at Commodore was unaware of any such violations.

After several months of contacting different executives at Commodore, I was told that steps were being taken to make sure people used the name correctly. When I pointed out that some of these publications were now in production, and that it may be too late to stop the widespread general use of AMIGA as an open term, I was assured that letters were in the mail and that a licensing agreement plan was in the works.

Since a license to use AMIGA in our title was all I wanted, I asked how could AC apply. I was told I could write a letter to Commodore's legal department, requesting the license. They would review the request and make a decision. This seemed to be a suitable solution. I then asked how the selection and approval would be handled. I was informed that special preferences would be granted to those companies already making use of the title. The speaker stressed that it was only fair that these individuals receive first rights due to their sizable investments. I was then told that only a few such agreements would be allowed.

In short, those organizations which side stepped or completely ignored Commodore Business Machines' rights to AMIGA would be the first groups sanctioned to use the term. Those groups and companies who refrained from taking the "easy road" of product recognition may never have the right made available to them.

Product Recognition

Please do not misunderstand our intentions. The best thing that could happen to the Amiga is for a large group of materials championing the Amiga name to make their way into the public eye. It has been difficult for this machine to grow in the general public's awareness without openly recognizable support by third party developers on dealers' shelves.

The word Macintosh has been registered and licensed by Apple Computer. Yet those developers who have neither the time nor the resources to license "Macintosh" have used the term "Mac". It is unfortunate the Amiga has not had a similar title to use. Oh yes, there have been some attempts by Amiga developers to use "Ami", but either through lack of marketing or lack of interest, the "Ami" title is little known outside the already converted Amiga community.

Amiga is it. It appears that Commodore's slow reaction in securing their rights in this matter could leave them unprotected. The consumer can lose too, as there is no control of the style, type, or nature of those who may use the AMIGA name.

So why have we joined these ranks?

In truth, we have not. The title of our magazine remains Amazing Computing. We have always been "for the Commodore Amiga". We have read through the specifications Commodore wishes all developers to follow, and have followed them all to the best of our knowledge, except one:

> "Use Commodore trademarks as a brand name or a proper adjective and not as a noun, verb, possessive, plural, or in a generic sense."

Commodore wants us all to refer to the Amiga as "the Amiga computer", and not just "the Amiga." Unfortunately for Commodore, this is not only impossible to control, since virtually everyone refers to the Amiga (see) in this way, but there is only one Amiga, therefore it is redundant to say "the Amiga computer." Amiga is the computer.

Solutions?

Is there a solution? I am afraid not. Commodore, blessed or otherwise, now has a rather large string of products by third party developers who will continue to use the AMIGA name. This gathering crowd should help sell Amigas to the general public as they become aware of the Amiga's (I did it again!) popularity.

Commodore, lacking the foresight to correctly monitor the use of their computer's name, may have seen these rights forfeited. Commodore has an obligation to maintain their trademark (have you ever seen those ads for Xerox® reminding you to refer to a photostat as a photostat). If they do not administer this right fairly and consistently, they run the risk of losing their right.

In some ways, this could help the Amiga community. However, in other respects, it is a very unfortunate turn of events.

Sincerely,

Don Hicks
Managing Editor, Amazing Computing

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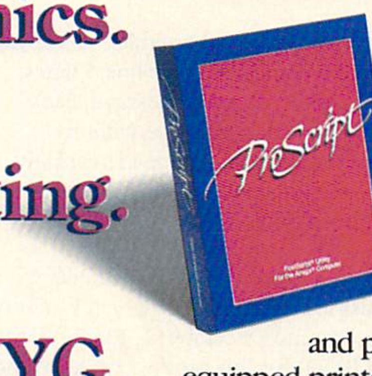

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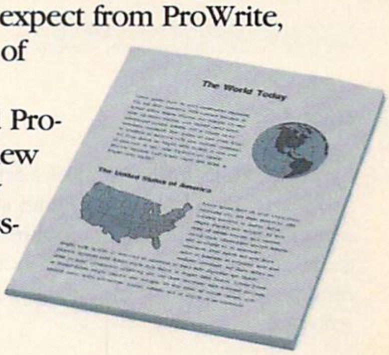

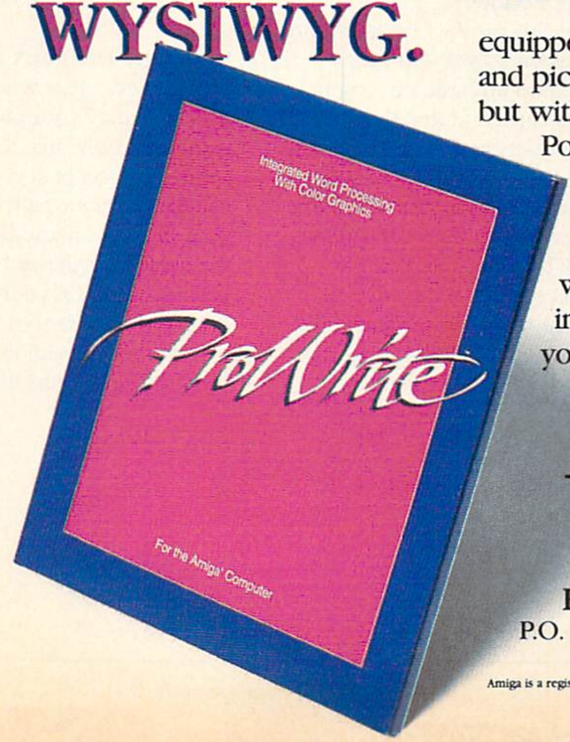

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Dear Amazing Computing:

We just received our spring Product Guide and what a fine job it is! It is obvious that a lot of thought went into its organization (with the inclusion of the public domain disks and the virus protection), and the freely distributable software Index is a great idea!

I want also to resolve a price discrepancy. We sent a price and product list some time ago. The prices in the catalog are based on the original information. Since that time, we enhanced and upgraded several of our products (we're always doing that) and adjusted the prices accordingly. We then shipped an updated catalog. So, the prices in the Product Guide are the old ones, but no problem. We are more than happy to honor the old prices and ship the enhanced versions for as long as people request them! If they say they saw it in Amazing's Product Guide, they get the special price. It's the honorable thing to do and we just wanted to let you know our policy on this one.

Congratulations on an <u>enormous</u> job well done!

Very Sincerely,
Julie Petersen,
Graphic Services

Dear AC,

I would like to inform you of a few problems that I have found with some recently released Amiga software. I offer these comments as a means of educating others about the varying quality of Amiga software.

The first (and most obnoxious) product is a desktop publishing system called "Publisher Plus" by Northeast Software Group. I purchased this product to do a local newsletter. The features described in their ads matched my needs fairly well, and the price was reasonable (about $70). As I found out, the actual software is VERY buggy. It is hard to work for even an hour without this program displaying the almighty Guru message. In addition, a number of other aggravating bugs exist. For instance, if you choose italics as a font style (using the keyboard shortcut) and start typing, the cursor will not move, but the text will scroll to the right, spelling your words out backwards. It is also impossible to get exclamation points in the Helvetica font even though they exist and can be seen if loaded into the notepad. It appears to me that this product has never gone through any quality control process. I challenge you to locate a copy and examine it for a while. I'm sure you will understand my concern.

Above all of their other faults, I have call ed their technical support line 5 times, only to get a recorded message. Each time I have left a message with my phone number (and some increasingly angry remarks), all of which seems to have been done in vain.

The other product that I would like to discuss is Deluxe Print II which was sent to me around December 1. I had ordered (and PAID) for this product back around February '88 when a flyer was sent encouraging me to upgrade my original. The check was cashed at that time even though the product came 9 months later. In November, I received a letter saying that my long-awaited program was soon to ship, but was being delayed to allow quality control to make sure that everything was perfect. Well, when it finally did come, I ran the program and found it did indeed do all the wondrous things that were advertised—except print.

That's right, Deluxe Print II does not support or work with any of the 1.3 printer drivers which have been around for at least 4 months now. Since I have a NEC-CP6 24-pin printer, I find the program a bit useless. I do have an old 1.2 driver for it, but it is extremely slow, taking about 15 minutes to print one page.

How a large company like Electronic Arts can put out a product that is outdated from day one is beyond me. I have called them up and they say they are thinking about possibly doing a 1.3 version, but could give no assurances. Another problem that I found with this program (and also with Deluxe Paint) is the limited set of fonts that can be loaded in. If you add three more fonts and load them in, the program hangs and cannot be killed. Programs like this need to be more flexible with respect to fonts.

I have also found that under 1.3, my original of Ferrari Formula One no longer works. I am not sure why, but for now, it guru's as soon as the actual driving scenes appear.

I would appreciate you contacting these companies on my (and the Amiga computing communities) behalf.

Just so this letter isn't a total downer, here's a few tricks with 1.3. If you would like to display your path in your prompt string, but don't like the continually changing prompt size (or position) you can display your path on one line, and your prompt on another. Just incorporate the escape sequence "<esc>D" into your prompt string (in your Shell-startup file). This sequence moves the cursor down one line to the beginning of the line. My prompt string looks like this:

```
prompt "%N<esc>D$ "
```

(continued)

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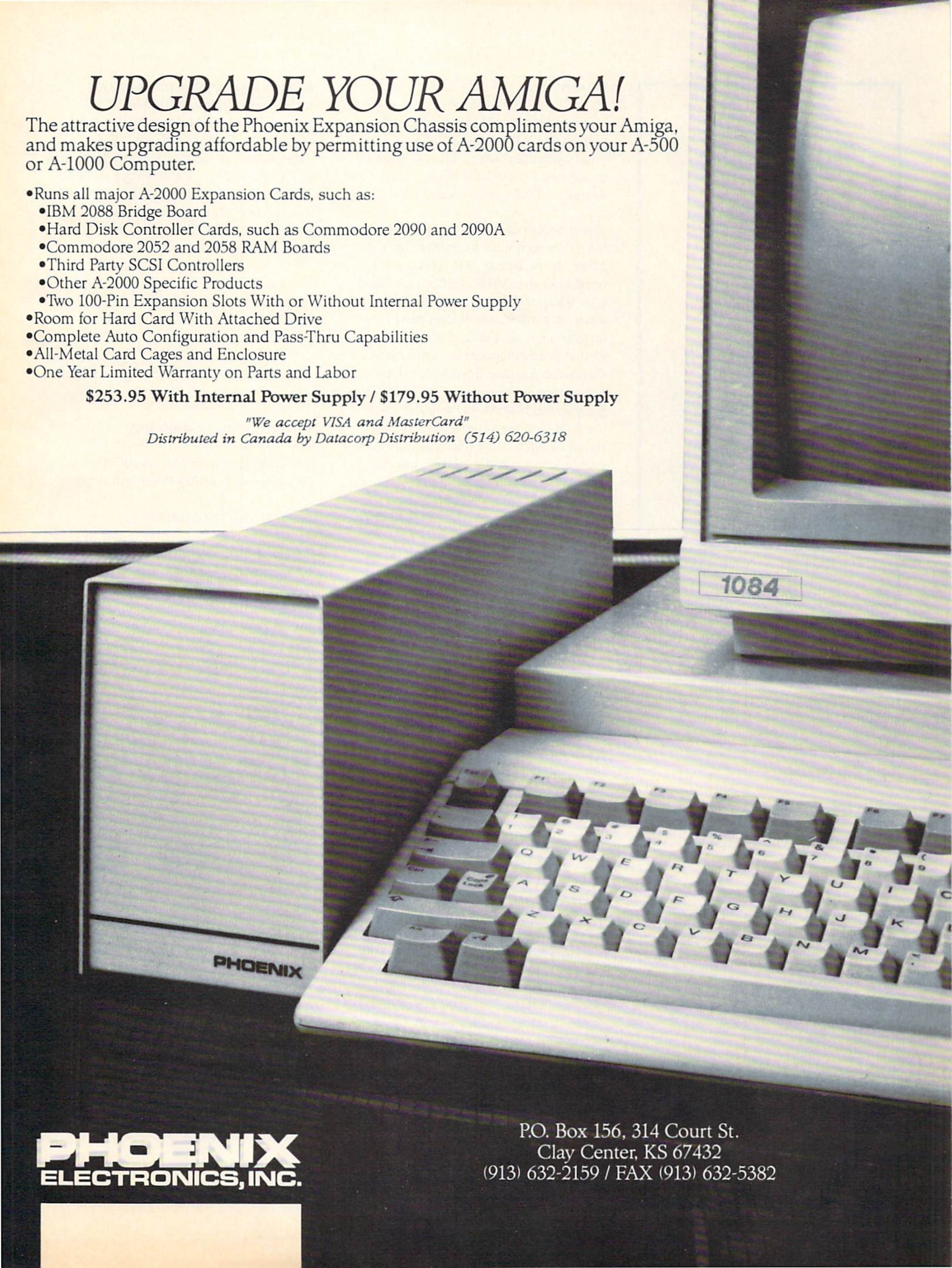

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Make sure that you substitute a real escape character for the <esc> and use a capitol D. Another trick is to change the window size of your Shell by adding a tool type (to the Shell icon via "info") that looks like this:

```
WINDOW=NEWCON:0/0/640/200/AmigaShell
```

This particular string would bring up the Shell full screen each time.

Just in case you need to know, I am working on an Amiga 2000, currently running version 1.3 (although I tested Publisher Plus under 1.2 and found the same bugs) with 1 meg memory> I also have a GVP SCSI controller connected to a Quantum 82 meg hard disk. I hope to hear from you soon about these software manufacturers.

Mark Steffensen
Mt Prospect, IL

Dear AC,

I enjoyed reading Phil Saunders' "Converting Patch Librarian Files" article in your December issue, and was gratified to see that he used my book, "The Complete DX7", as a reference.

The problem of converting patch files from one computer to another need not, however, be nearly as involved if you remember that MIDI itself is a standard, regardless of the device from which MIDI data originates. Rather than transferring patch data in a raw, binary format from computer to computer (in this particular case from a Mac to an Amiga) via a null modem cable, Phil may have found his task to be much easier if the data had been transferred over a standard MIDI cable from the Mac's MIDI interface to his Amiga's MIDI interface. To facilitate the transfer, there's no need to use any kind of communication program—simply use the patch librarians themselves. Instruct the receiving computer to receive a full bank of patches and then tell the sending computer to transmit a full bank. Neither computer will have any idea that it is "talking" to another computer as opposed to the synth itself, since any handshaking that is necessary (and handshaking is not used by Yamaha instruments, anyway) will be done by two librarian programs. The receiving computer will then turn to its librarian software to do all the work of converting the incoming MIDI data to whatever format is required for disk storage.

At my facility, the Center for Electronic Music (a non-profit facility, based in New York City and open to the general public), we have PC-compatibles, several Macintoshes (Pluses, SE's, and II's), along with a number of Mega ST computers (no Amiga as yet, but we're talking with Commodore and hope to have a 2000 very soon). We're constantly transferring patch data from one computer to another, and this is by far the easiest, fastest, and most efficient way of accomplishing that task.

Incidentally, we have published a number of "Compact Guides" to MIDI software for the Mac, the PC, the Atari ST, and the Commodore 64/128, and expect to be producing a book dedicated to MIDI software for the Amiga in 1989. Readers who are interested in learning more about our unique organization can write us at: 432 Park Avenue South, New York, NY 10016.

Sincerely,
Howard Massey
New York, NY

Dear Amazing Computing,

The following might be useful in your Amazing Mail or Bug Bytes columns:

SA4D MAGIC NUMBERS!

The new Sculpt Animate 4D has some undocumented features which may help you. As in Sculpt 3D, you enter the 'Magic Number?' requester by clicking on the DOWN window and pressing CTRL D. The following is a list of 'Magic Numbers' and their associated requesters:

MAGIC #	REQUESTER	DEFAULT VALUE
7	Which color to change?	0
13	Metallic Reflection Coefficient?	20
99	Inbetweening with respect to time?	NA**
100	Mirror Recursive Depth?	5
101	Glass Transmission Recursive Depth?	5
102	Glass Reflection Recursive Depth?	1

** This number actually refers to the color register number, so if you don't like your screen colors, here's where to change them.*

*** No numeric default, options are CANCEL or OK.*

These features give greater control over the Glass, Mirror and Metal textures. Remember, these are undocumented and not supported by BYTE by BYTE's SA4D Technical Support.

(continued)

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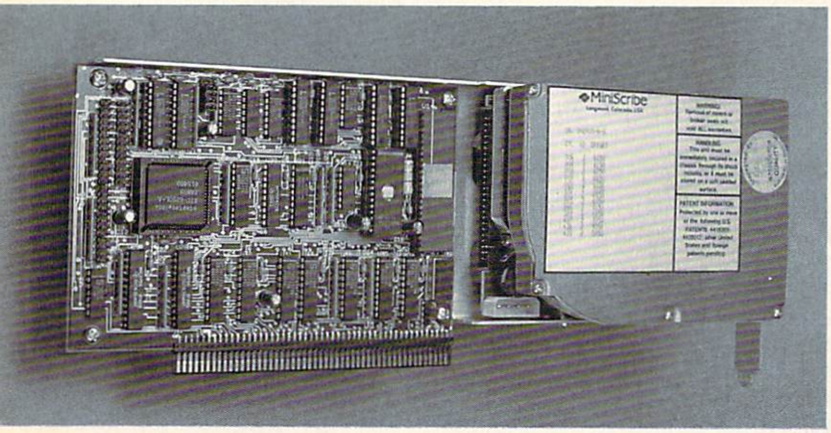

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The HardFrame/2000 photo shows the product with a MiniScribe twenty megabyte hard disk installed. Hard disks are *not* included in the purchase price of HardFrame. Note that if placed in the first slot, HardFrame uses only one slot even with a disk attached.

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Geary Boulrice
San Diego, CA

P.S. When I called SA4D Technical Support they acknowledged these features and verified their operability and said currently they are for in-house use only and that they might be supported in future upgrades.

Dear AC:

As newsletter editor and contact person for the Calvert County Commodore User Group, I ask that our group be listed in your publication to better enable us to reach/serve the needs of users of all models of Commodore computers in our area.

Meetings are held on the 2nd Saturday of each month, from 1:00 to 5:00 PM. Meeting place is downstairs at the Calvert Library in Prince Frederick, Maryland.

While CCCUG does not officially sponsor a BBS, one member, Bert Schwartzwelder, does reserve a section on his BBS for CCCUG news: 1-301-586-EBBS (1-201-586-3227) via modem.

In addition, if you or any of your advertisers would care to send me approximately 30 flyers/ads/brochures, I will mail them to our members along with our monthly newsletter.

Thank you for your interest and assistance.

Sincerely,
Vicki Harmon (for CCCUG)
1866 Bay Street
Huntington, Maryland 20639
(301) 535-3842

Dear AC,

Just a note to inform you of the existence of our users group, M.A.U.S. (Mile-High Users Society). Enclosed you will find our two latest newsletters. Our members live in the greater Denver metro area and meet at 7:00pm on the second Thursday of every month as described in the newsletters. After the scheduled meeting, many of us invariably continue shooting the breeze about our favorite machine for several hours at a nearby restaurant. In addition to the monthly meetings, members get a discount at a local Amiga dealer.

Yours sincerely,
Willie Schreurs.
M.A.U.S.,
P. O. Box 3406
Englewood, CO 80155-34

Dear AC:

Please include the following in the your list of Amiga support groups:

Laurel-Bowie User Group
Laurel, Maryland
President: Rick Carrick
Contact Person: Rose Ragan (301) 488-8686

L-BUG is a Commodore computer user group supporting the C64, C128, and Amiga. We have an extensive public domain library for the use of our members, a monthly newsletter, and several SIG's.

If you need more information, please contact Rose Ragan, 8808 Hawthorne Court, T2, Laurel, MD 20706, ph. (301) 488-8686.

Thank you for your assistance.

Sincerely,
Rose Ragan
L-BUG Public Relations

•AC•

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New Products

and Other Neat Stuff

by Mike Creeden

Face-Off

Springtime is coming, sports fans, and that can only mean one thing. You guessed it: the Stanley Cup playoffs. Now you can warm up for the playoffs with the only hockey game that bears the name of the Great One: **Wayne Gretzky Hockey**, from *Bethesda Softworks.*

To give Wayne Gretzky Hockey the most realisitic feel possible, Bethesda called in Gretzky and a slew of other hockey pros to work with the developers producing the game. Their efforts weren't wasted. Each player acts independently, and you never know what might happen.

Multiple player skill ratings let you rate your players in 11 skill categories, including skating ability, stamina, puck control, and aggression. Options include dual game speed, multiple difficulty levels, practice time, adjustable period length, and more. You can coach the team yourself, or let Number 99 take the helm while you watch from the stands and enjoy a hot dog.

Realism abounds here. The ice, freshly zambonied at the game's start, shows grooves of wear as the game progresses. And you'd better keep your men aggressive, because fights are bound to break out. When they do, digitized fight videos will give you a close-up view of the flailing punches while you listen to insults being spewed through busted teeth.

Those are real punches you'll be hearing. The digitized sounds are taken right from real hockey games. Instant replays let you relish that smooth breakaway—or that crushing right hook—one more time.

And since no simulation would be worth its salt without the zebras, animated referees will keep an eye on the action. So keep it onsides—and watch that stick.

The game is even endorsed by the Great One himself. So celebrate the coming of spring the Canadian way. Play some hockey.

Bethesda Softworks
15235 Shady Grove Rd. Suite 100
Rockville, MD 20850
Tel: (301) 926-8300
$49.95

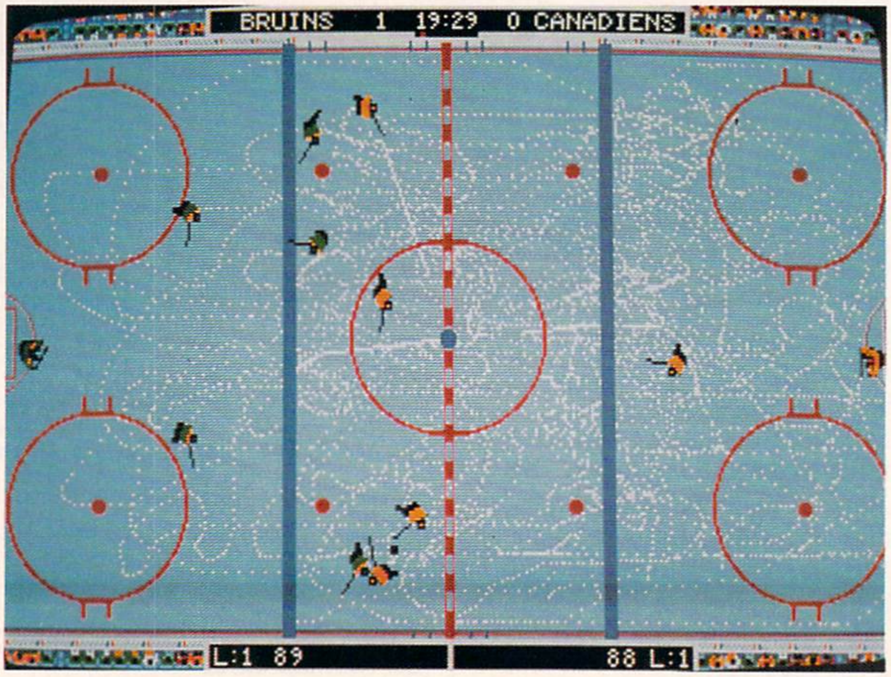

Figure One
*A screen from **Wayne Gretzky Hockey**. The ice, once smooth as silk, begins to show the wear and tear from 10 hard-skating hockey pros.*

Desktop Budget

Did you ever feel as if you were operating on a shoestring budget? Well, now you can run that shoestring budget from your desktop, with *Gold Disk's* **Desktop Budget**, from the Home Office series. Desktop Budget lets you run your home or office budget using your Amiga and this icon-based personal finance system. Each element of your budget—from airline and auto expenses to stocks and savings— is represented by an icon. You can create your own icons using the DB-Editor (to give your debts that personal touch).

(continued)

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AMIGA *questions?*

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easy to read format, by category, indexed
and with complete descriptions?

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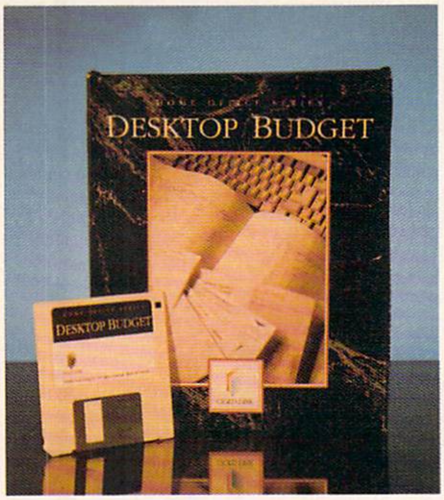
(Left)
Desktop Budget *lets you run your home or office budget using your Amiga and this icon-based personal finance system.*



(Right)
FA-BASIC 3.0 *offers BASIC programmers a structured, interactive programming environment full of features that let you tap into the full power of the Amiga.*

You can record, retrieve, or edit transactions, or program Desktop Budget to make automatic transactions (so you don't even have to be there when you go bankrupt). You can record, retrieve, and edit payments, then print your payment list in a report. Indeed, you can print just about any aspect of your budget in a report. These reports can be in either text or graphic form, and they are saveable to disk. Finally, when you want to know your overall financial picture, you can have your budget reported on a monthly or yearly basis.

The program features an icon editor, a calculator, and a clipboard. The icon editor lets you create and edit 4 color icons for use on the Workbench screen, and 8 color icons for use on the Desktop Budget screen. It also provides freehand, line, box, circle and area fill drawing, and a window for making detailed drawings.

The calculator lets you make quick calculations on the Desktop Budget screen, then paste the results of your calculations into your budget. These calculations can then be transferred to the clipboard, and then to any other program that can read from the clipboard.

Desktop Budget. Going broke was never so much fun.

Gold Disk Software
P.O. Box 789
Streetsville, Mississauga,
Ontario Canada L5M 2C2
Tel: (416) 828-0913

Stuff-It!

If you're still feeling artistic after customizing those Desktop Budget icons, you can customize your own pull-down menus with **Stuff-It!**, from *Soft-Link, Inc.* Stuff-It! lets you create your own menus, which you then "stuff" with series of your most commonly used keystrokes. The menu stores and plays back these keystrokes when you request them. You can use your Stuff-It! menu to interact with other multitasking software that requires keyboard input.

Stuff-It! works like a function key. Each Stuff-It! menu item has its own descriptive name, and you can stuff as many keystrokes into it as you like (limited by memory, of course). When you pull down a "stuffed" menu, the keystrokes you recorded will be sent to the program you're working with, just as if you had typed them in from the keyboard.

Stuff-It! comes with a few sample menus which can be used as is, or you can modify them to suit your needs. The keystrokes in the Stuff-It! menus are displayed in the program's window to let you see just which keystrokes are being executed.

Stuff-It! menu items can perform keystroke actions of their own, or they can have sets of subitems. Up to 31 subitems can be attached to each menu item. Keystrokes (Stuff-It! calls them actions) can be attached to both menu items and subitems, although menu items that have actions attached cannot also have subitems.

Special identifiers let you tell Stuff-It! when you want to use special keys such as the function, arrow, shift, control, or alternate keys. Using the file specifier, you can have your Stuff-It menus restore other Stuff-It! menus files.

Stuff-It! runs with Workbench or CLI (version 1.2 or higher). It requires no special hardware, and it is not copy-protected.

Save all those keystrokes. Just Stuff-It!

Soft-Link, Inc.
P.O. Box 304
Coventry, RI 02816
$39.95

M.A.S.T.

Another mini peripheral has crawled out from under the the M.A.S.T. *Memory and Storage Technology (M.A.S.T.)* has recently introduced **MICROMEGS**, an alternative to the Amiga 501 internal expansion RAM. MICROMEGS features 1 megabit DRAM technology, which reduces the card size by about one half, while also reducing the length of the onboard conductors to minimize transmission line effects, and to offer greater noise protection.

The 1 megabit DRAM technology also means that the card only requires 4 CMOS RAM chips, for significant savings in power: MICROMEGS use 8mA in

(continued)

THE DIRECTOR™

Display and Animation Language

"If an Oscar were to be presented for Technical Excellence in Amiga Graphics, the winner would certainly be (the envelope, please) - The Director . . . .an exciting, unique program. . .likely to become a classic. . ."

Steve King, Commodore Magazine
April 1988

"I must give The Director top marks for ease of use and capability. For the novice or serious presentation creator, this package is unequaled. It belongs on the shelf of anyone who considers himself an Amiga graphics connoisseur."

Oran J. Sands III, Info Magazine
June 1988

Envision a creative freedom you've only dreamed about. Imagine page flipping, color cycling, text generation, and ANIM animation, all combined at the same time on the screen. Now, from the simplest slideshow to the most sophisticated desktop video production, that dream comes true with The Director.

The Director uses an easy, Basic-like vocabulary. It provides powerful image and memory management, blitter, text and effects control. Anything created with The Director can make use of its sound module, and can be fully interactive via mouse or keyboard. A freely distributable player program, the Projector, is also included.

- Uses any IFF images, any resolution, any number of colors
- Fades, Dissolves, Blits, Wipes, Stencils
- Page flip full or partial screens
- Preload images, fonts and sounds up to your memory limit
- Flexible script-based structure
- Basic-like vocabulary: For/Next, Gosub/Return, If/Else/Endif
- Arithmetic expressions, random number generator, variables
- Execute AmigaDOS commands from the script
- Text string and file input and output
- Keyboard and mouse interaction
- Digitized soundtrack module
- Supports HAM and overscan
- Supports IFF ANIM playback
- Built in drawing commands
- No copy protection
- And much more. . .

$69^{95}

DIRECTOR DEMO DISKS $10.00 each
PROBE (512 K)
RGB (1 MEG)

NEW! TOOLKIT for THE DIRECTOR

The Director Toolkit is a disk packed with features and enhancements to expand the capability of The Director. There are new wipe routines, a palette selector, a pie chart generator and much more. The new and enhanced BLIT Utility has a powerful interface to help create Wipe, Dissolve, and BLIT operations. It also automates the process of moving an object over a background, generating a complete working script.

This disk is intended to be used with The Director software.

- New wipe routines
- Enhanced BLIT Utility including object movement over backgrounds
- Standard file requester callable from Director scripts
- Screen save from Director scripts
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- Sine and cosine functions
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Torrance, CA 90510
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standby mode, and 20 mA when the board is being accessed continually. MicroMegs also includes a battery-backed real time clock. It is now available through dealers.

M.A.S.T
3881 Benatar Way
Chico, CA
95928

A Call for Artists

Artists everywhere, now hear this: This summer, *Mojo Software* will assemble an **Art Show on Disk** of pictures created with the Mojo's **Basic Art Encoder** and its freely distributable little brother, **MiniCoder**. Anyone who submits a 320 x 200 slide show by the July 1st deadline will have at least one of those images included in the Art Show on Disk collection. (The images must be freely distributable, and the disks will not be returned). So, get those images in now, and have your work displayed in an art show.

Using the Basic Art Encoder for those images shouldn't prove difficult at all. It's a simple paint program that operates like any other menu-driven graphics tool, with one exception. Instead of saving information about every pixel in IFF format, the Basic Art Encoder produces an AmigaBasic routine that will recreate your picture using commands. This reduces the huge IFF file into a fairly small routine you can paste directly into your program.

The Basic Art Encoder comes with a freely distributable slide show program which lets you put hundreds of images onto a single disk. You can create a program that displays one image every five seconds for twenty minutes—without ever reading off the disk. All the routines are in memory once you load the slide show.

Save yourself time and frustration by using the Basic Art Encoder to construct your graphics routines. And Mojo will display the results at the Art Show on Disk.

Mojo Software
2261 Market St. # 464
San Francisco, CA
94114

Basic Art Encoder
$24.00

No excuses, Back It Up!

Rare is the person who is doesn't know they should back up their files often. Equally rare is the person who actually does it. Why? Well, backing up takes time. Backing up a thousand-line program, or a 50-page WP document, or a huge graphics image takes time, and lots of it. No one intends to let all that time go by between saves. It just happens. **ExpressCopy**, from *Express-Way Software,* one of your biggest "didn't want to waste the time" excuses is gone.

ExpressCopy can perform hard disk backups and copy files from hard disk to floppy disk at up to 1 MB per minute, or 600Kb per minute with verify of backup disks. The backup disks have the same directory structure and file attributes of the original files, and can be used normally. You can write Normal or Fast File System-compatible disks, and collect files to be copied by DataStamp, filename pattern matching, the archive bit, or the source directory. There are options for setting the archive bit, verifying the data written to the floppy, and estimating the number of disks required for the backup.

Create up to 4 backups at a time, or preload disks in up to 4 drives. ExpressCopy automatically formats and verifies new disks. Also, if a bad disk is found during the verify, you can insert a different disk and start from the beginning of that disk. There's no need to restart the backup.

For effective multitasking, you can change ExpressCopy's priority while it's running. If creativity strikes in the middle of a backup, halt the backup and use the drives normally. Then restart later.

ExpressCopy backup restoration uses any file copy program, your favorite directory utility, or ExpressCopy's own Restore program. The program has no copy protection, and runs from Workbench or CLI. It requires at least 512K RAM and Version 1.2 or higher of AmigaDOS.'

Avoid the (hard drive) crash. Take the Express-Way.

Express-Way Software, Inc.
P.O. Box 10290
Columbia, MO
65205-4005
Tel: (314) 474-2984
$44.95

GFA-BASIC 3.0

Antic Software's **GFA-BASIC 3.0** offers BASIC programmers a structured, interactive programming environment full of features that let you tap into the full power of the Amiga. The package includes over 300 new commands, and speed comparable with C. You can execute non-BASIC applications from within the BASIC program, and even call a routing written and compiled in C.

A new function, Hide, lets you compress procedure screens to hide procedures once you debug them. The Editor automatically indents commands within loops and conditions. Subroutines can be replaced by symbols, or collapsed with a single keystroke. Additional commands give the IF-ELSE-ENDIF statements greater flexibility. Expanded loop commands like DO UNTIL, DO WHILE, LOOP WHILE, and LOOP UNTIL give you more flexible looping.

The Interpreter uses true integer arithmetic for fast calculation speed, and floating decimal point arithmetic for extra accurate calculations. The package also includes a run-time module, joystick commands, bit manipulations, Boolean operations, in-line C and Assembler commands, a built-in text editor with syntax checking, and easy access to all libraries.

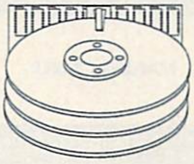
Antic Software
544 Second Street
San Francisco, CA
94107-9989
$139.95

Send your new products and announcements to:

Michael Creeden
c/o Amazing Computing
P.O. Box 869
Fall River, MA 02722

•AC•

HARD DRIVES



...an Introduction

by Jon A. Boulle

In the beginning there was......

Techmar, MicroForge, and Byte by Byte. A 20 MB hard drive cost $1200. The Cadillac of the hard drives, the "Pal", cost about $3200 without the hard drive! These drives are no longer available except as used items. Instead, we have generic PC priced hardware. This lower priced hardware is causing a lot of confusion among new and less experienced users and potential buyers. A case in point is what happened to me.

I was trying to sell a hard drive SCSI controller for the A1000 and I got a call from a prospective buyer. As we talked about the controller, it became obvious to me that he had little or no concept of what he was doing. I'm not being derogatory, it's just that he thought all he needed was a controller and a hard drive to use it. I asked if he was going to use an OMTI or an ADPETEC card. He didn't know he needed one. I asked if he had the cables necessary. He didn't know he needed those either. The net result was that I didn't sell the C-Ltd controller. Not because he didn't want it, but because the cost had just about doubled for him and he couldn't afford all the equipment needed. The idea he had was that a controller cost a couple of hundred bucks, a hard drive about $350, so for $550 he would have a hard drive.

This misconception is widely spread, especially in the Amiga world. AS co-SYSOP of one of the most popular Amiga specific BBS' in the country, I began to notice that more and more questions were being asked on the board about hard drives, problems, costs, "how comes...", etc. The problem I was faced with is that old messages scroll off the message base as new messages are added and I wound up answering the same questions time after time. In frustration I began to write the answers down and posting them as a text file.

The flood of hard drive controllers on the market now has made it more and more essential for a more comprehensive file. I began to ask friends who owned other hard drives and hard drive controllers to give me information on their experiences with their hardware. This file began to grow and grow. Thus this series of articles began.

This series will provide basic, generic information about hard drives. As the series continues, I hope to write an article specifically for each hard drive/ controller on the market. I have contacted or will contact every manufacturer currently selling an Amiga specific hard drive. The articles will contain the information provided to me. I will then include user information from the Amiga community. No sugar coating, no company drivel, "..just the facts ma'am, nothing but the facts...".

I also hope this will help those who are considering buying an older piece of equipment that is no longer being supported, a MicroForge or Techmar hard drive, for example. That way you will have some source for information other than what the seller told you. This information might be invaluable when you are attempting to set up your new hardware around 3 a.m.—when none of your friends would especially enjoy a phone call.

I'll point out the pitfalls, the traps, the possible errors in the documentation, the kind of things that drive you absolutely nuts when the documentation writer knows exactly what he was talking about, but no one else does.

One of the keys to the success of this series of articles is your help. Your questions will provide the backbone of this series. As I answer more questions, I will be able to compile them into a rational series for everyone. Please feel free to contact me with your questions/ answers on PLINK (PeopleLINK) as "Jon B" or on Amiga Doc BBS (312)351-8815. If you own what can be considered an "Exotic" setup, I particularly want to hear about it. Just remember, I don't have all the answers but I have a lot of information that can help in a lot of instances.

There are a few hard drive interfaces available in the PC marketplace today. In order of transfer speed they are: SCSI (up to 700k/sec usually 500k/sec), EDSI (300-400k/sec), and ST-506/412 - generic PC (approximately 275k/sec). These speeds will vary so don't be upset if you can get faster reads and writes than I have listed here. That's quite possible. In some cases, it will be faster since the hard drive's access time will help determine this transfer speed.

> *Basic, generic information about hard drives. No sugar coating, no company drivel, "..just the facts ma'am, nothing but the facts...".*

We will primarily discuss the SCSI and the ST506/412 since these are the hard drive interfaces we will most likely see and use. A definition is in order. SCSI means "Small Computer Systems Interface". Don't be fooled by this name. This standard is only adhered to the point that all basic commands work according to this standard, not all SCSI hard drive manufacturers comply to all SCSI commands. In fact most do not. A case in point is that the SCSI bus is supposed to be a 50 pin type connector. Apple has changed this. Their SCSI bus connectors start out life as a 50 conductor cable, but then change to a 25 pin DB connector.

(continued)

HARD DRIVE SPECIFICATIONS
3.5 INCH HARD DRIVES

MANUFACTURER	PART NUMBER	UNFORMAT CAP. (mb)	FORMAT CAP. (mb)	AVG. ACCESS (ms)	DATA TRANS/SEC
ST506/412 (MFM)					
Seagate	ST125-1	25.6	21.4	28	5.0 MBITS
kalok	Octagon 20	25.6	21.4	40	5.0 MBITS
Miniscribe	8425F	25.6	21.4	40	5.0 MBITS
Seagate	ST125	25.6	21.4	40	5.0 MBITS
Kyocera	KC20B		21.4	62	5.0 MBITS
Kyocera	KC20A		21.4	65	5.0 MBITS
Miniscribe	8425	25.6	21.4	68	5.0 MBITS
Fujitsu	M2226D2	38.0	30.0	35	5.0 MBITS
Seagate	ST138-1	38.4	32.1	28	5.0 MBITS
Per. Tech.	PT338	38.4	32.1	35	5.0 MBITS
Seagate	ST138	38.4	32.1	40	5.0 MBITS
Fujitsu	M2227D2	51.0	40.0	35	5.0 MBITS
NEC	D3146H	51.2	40.3	35	5.0 MBITS
NEC	D3142	53.4	42.0	28	5.0 MBITS
Toshiba	MK-134FA	53.4		25	5.0 MBITS
Per. Tech.	PT351	51.2	42.8	35	5.0 MBITS
Microscience	4050	53.3	44.5	18	5.0 MBITS
Rodime	RO3055	54.5	45.5	28	5.0 MBITS
Imprimis	94355-55	55.0	46.0	16	5.0 MBITS
Imprimis	94335-55	55.0	46.0	25	5.0 MBITS
Per. Tech.	PT438	68.3	57.1	35	5.0 MBITS
Rodime	RO3065	63.6	63.6	28	5.0 MBITS
Imprimis	94355-100	100.0	83.0	16	5.0 MBITS
Imprimis	94335-100	100.0	83.0	25	5.0 MBITS
ST-506/412 (RLL)					
Kyocera	KC30B		32.7	62	7.5 MBITS
Miniscribe	8438	38.4	32.7	68	7.5 MBITS
Seagate	ST138R-1	38.4	32.7	28	7.5 MBITS
Seagate	ST138R	38.4	32.7	40	7.5 MBITS
Kalok	Octagon 30	38.4	32.8	40	7.5 MBITS
Kyocera	KC30A		32.8	65	7.5 MBITS
Per. Tech.	PT251R	51.2	43.7	35	7.5 MBITS
Comport	2040	51.3	43.7	35	7.5 MBITS
Seagate	ST157R-1	57.7	49.1	28	7.5 MBITS
Per. Tech.	PT357R	57.6	49.1	12	7.5 MBITS
Seagate	ST157R	57.7	49.1	40	7.5 MBITS
Rodime	RO3075R	73.7	59.9	28	7.5 MBITS
Per. Tech.	PT376R	76.9	65.5	35	7.5 MBITS
Rodime	RO3085R	86.0	69.9	28	7.5 MBITS
Per. Tech.	PT4102R	102.5	87.4	35	7.5 MBITS
Imprimis	94355-150	150.0	128.0	16	7.5 MBITS
Imprimis	94335-150	150.0	128.0	25	7.5 MBITS

This was done to cut down on RF (radio frequency) interference in a home environment, because a 25 conductor cable is less likely to cause this interference than a flat, 50 conductor cable. This SCSI bus connection is known as "pseudo-SCSI". Another part of this is that usually only 25 conductors actually do anything. The other 25 are connected to ground. Most of the SCSI drives you will find available are the "pseudo-SCSI" variety because the Apple/Mac is the most widely installed computer that utilizes this physical format. For our purposes, don't worry, the majority of SCSI controllers for the Amiga also support this DB-25 connector.

The important thing to be aware of is that for one hard drive installations, this cable change will have no bearing. Especially if you are installing the hard drive in a 2000. It is only when you attempt to add an additional drive that this connector becomes important.

Recently, Seagate and Miniscribe have begun to manufacture hard drives with built-in SCSI controllers. The one drawback is that the imbedded adapter only controls one hard drive. The Adaptec and the Omti can control two hard drives (with the proper Tee adapters). For those of you who are fortunate enough to have more than one hard drive this is important. For the rest of us, it really doesn't matter. A drawback is that a hard drive configured this way is roughly $75-$80 more expensive than a ST-506/412 type drive.

The following is a excerpt from UseNet authored by Thad Floryan concerning pin-outs and a brief discussion about SCSI interfaces. Thad's work was reviewed and checked by John Lohmeyer, chairman of the ANSI X3t9.2 SCSI committee, who commented favorably.

The excerpt is as follows:

Many systems supporting SCSI (Amiga, Mac etc.) use a DB25 at the host to save real-estate: The SCSI devices themselves use the "correct" 50-pin connectors (either Centronics 50-pin or the dual 25-pin row kind). The so-called "Mac System Cable" has a DB-25 on one end and a Centronics 50-pin on the other. SCSI interconnects are 50 wire.

At the end of this posting are the pin-outs of the DB-25 and the 50 wire (see table one—SCSI pin-outs.) One thing I have noticed (after adding over 1 GB HD and a Fujitsu 190MB tape drive to my Amiga's SCSI bus) is that some device manufacturers take liberties with SCSI wires 20, 22, 24, 28, 30, and 34. Some tie them to ground, some tie them to +5vdc and some leave them (properly) unconnected.

Another caveat with multiple devices on a given bus is to be SURE that only one is supplying +5vdc on SCSI pin 26 for terminator power. Some manufacturers provide jumpers to enable/disable, some feed thru a diode, some feed the power out "raw", and some do nothing. With my system, I supplied terminator power from the host adapter, and used an external terminator at the end of the bus. From my experience, I suggest that when you're making the cabling, pull pins 20, 22, 24, 26, 28, 30 and 34 from the connector that attaches to the embedded SCSI drive and/or I translator.

I've noticed that Apple's SCSI interconnect cables do not pass pins 20, 22, 24, 28, 30 and 34 (for the reason I've noted above). Another observation I'd like to make is that many of the third party consumer-grade manufacturers of SCSI HDs wire their boxes incorrectly. SCSI specs mandate no more than a 10cm "stub" off the bus, yet many Mac-type drives I've opened up (Just gotta see what's in there! :-) have a 2" 50-wire connection joining the two Centronics connectors continuing with a 15" stub to the 50-wire connector on either an embedded SCSI drive or an Adaptec 4000A or 4070 translator. This mis-wiring would account for the problems people have running a SCSI bus out to 20 feet. (I have no problems since I wired my system correctly, and the last device is 19' from the host adapter.)

Remember: SCSI wiring is supposed to be daisy-chained.

Final note: You'll save yourself a lot of time (and possibly grief) by simply buying a so-called "Mac System Cable" (50-pin Centronics to 25-pin DB25; the brand I use is Data-Spec (just as good and much less expensive than the stuff from Apple and other third party manufacturers).

Thad Floryan [thad@cup.portal.com or.. ..!sun!portal!cup.portal.com!thad

The ST-506/412

The ST-506/412 interface is the one that most people are accustomed to seeing. Early in PC history, who would have thought that more than two mass storage devices would be needed! If you have ever poked around inside a MS-DOS PC you probably have seen this type of drive attached to a Western Digital hard drive controller. Don't misunderstand me, this is an old hardware interface but also a good one. It has been around a while and third party developers and OEM's have had a chance to "de-bug" this interface. It is now possible, with this older technology, to increase the storage capacity on a given drive via RLL encoding.

But all is not sunshine with this data encoding method. It is possible to compact too much data on a surface which results in the dreaded "Read/Write" error message being sent. This is self-defeating to say the least. It does no good to compact it to the point where it is unreadable. Hard drive manufacturers are well aware that their drives are being encoded this way so they are taking steps to allow for this. They began paying a lot more attention to the quality of the surfaces of the disk platters in order to accommodate this RLL encoded data, and most important, the error free

HARD DRIVE SPECIFICATIONS
3.5 INCH HARD DRIVES

MANUFACTURER	PART NUMBER	UNFORMAT CAP. (mb)	FORMAT CAP. (mb)	AVG. ACCESS (ms)	DATA TRANS/SEC
Rodime	RO652B	25.5	20.7	85	7.5 MBITS
Miniscribe	8425S	25.5	21.3	68	5.0 MBITS
Seagate	ST125N-1		21.5	28	7.5 MBITS
Seagate	ST125N		21.5	40	7.5 MBITS
Seagate	ST138N-1		32.2	28	7.5 MBITS
Seagate	ST138N		32.2	40	7.5 MBITS
Kalok	KL341		40.7	40	8.5 MBITS
Kalok	Octagon 40	52.7	40.8	25	8.5 MBITS
Quantum	ProDrive 40S		42.0	19	4.0 MBYTES
Miniscribe	8051S	51.3	42.0	28	8.0 MBITS
Per. Tech.	PT251S	54.2	43.5	35	2.0 MBYTES
Rodime	RO3057S	55.7	45.3	28	7.5 MBITS
Toshiba	MK-232FB	53.5		25	10.0 MBITS
Seagate	ST157N-1		48.6	28	7.5 MBITS
Seagate	ST157N		48.6	40	7.5 MBITS
Per. Tech.	PT357S	57.6	48.9	35	5.0 MBYTES
Per. Tech.	PT376S	76.9	65.3	35	5.0 MBYTES
Rodime	RO3085S	86.0	69.9	28	7.5 MBITS
Quantum	ProDrive 80S		84.0	19	4.0 MBYTES
Comport	2082		85.7	29	10 MBITS
Kyocera	KC8C		87.0	28	8.5 MBITS
Toshiba	MK-233FB	89.2		25	10 MBITS
Per. Tech.	PT4102S	102.5	87.0	35	5.0 MBYTES
Toshiba	MK-234FB	125.0		25	10 MBITS
Rodime	RO3130S	129.8	105.0	22	1.25 MBYTES
Microscience	6100	124.6	110.3	18	10 MBITS
Imprimis	94351-172	200.0	172.0	16	10 MBITS

Table One SCSI Pinouts

SCSI DB-25		SCSI 50-pin			
PIN /	NAME	PIN /	NAME	PIN /	NAME
1	REG	1	GRD	2	DB0
2	MSG	3	GRD	4	DB1
3	I/O	5	GND	6	DB2
4	RST	7	GND	8	DB3
5	ACK	9	GND	10	DB4
6	BSY	11	GND	12	DB5
7	GND	13	GND	14	DB6
8	DB0	15	GND	16	DB7
9	GND	17	GND	18	DBP
10	DB3	19	GND	20	GND (*)
11	DB5	21	GND	22	GND (*)
12	DB6	23	GND	24	GND (*)
13	DB7	25	N.C.	26	TER. POWER
14	GND	27	GND	28	GND (*)
15	C/D	29	GND	30	GND (*)
16	GND	31	GND	32	ATN
17	ATN	33	GND	34	GND (*)
18	GND	35	GND	36	BSY
19	SEL	37	GND	38	ACK
20	DBP	39	GND	40	RST
21	DB1	41	GND	42	MSG
22	DB2	43	GND	44	SEL
23	DB4	45	GND	46	C/D
24	GND	47	GND	48	REQ
25	N.C (TER. POWER)	49	GND	50	I/O

(continued)

HARD DRIVE SPECIFICATIONS
5.25 INCH HALF HEIGHT HARD DRIVES

MANUFACTURER	PART NUMBER	UNFORMAT CAP. (mb)	FORMAT CAP. (mb)	AVG. ACCESS (ms)	DATA TRANS/SEC
ST-506/412 (MFM)					
Microscience	HH-825	25.5	21.3	65	5.0 MBITS
Seagate	ST225	25.6	21.4	65	5.0 MBITS
Core Int'n'l	AT32		31.9	21	5.0 MBITS
Imprimis	94205-51	51.5	40.0	28	5.0 MBITS
NEC	D5146H	51.2	40.3	40	5.0 MBITS
Miniscribe	3053	53.3	42.2	25	5.0 MBITS
Miniscribe	3650	50.5	42.2	61	5.0 MBITS
Mitsubishi	MR535	50.9	42.5	28	5.0 MBITS
Seagate	ST251-1	51.2	42.8	28	5.0 MBITS
Seagate	ST251	51.2	42.8	40	5.0 MBITS
Core Int'n'l	AT43		42.9	26	5.0 mbits
Priam	ID45H		44.3	28	5.0 MBITS
Microscience	HH-1050	53.3	44.6	28	5.0 MBITS
Priam	ID62		62.0	28	5.0 MBITS
Microscience	HH-1075	74.7	62.4	28	5.0 MBITS
Miniscribe	3085	85.3	71.3	22	5.0 MBITS
Rodime	RO5090	89.2	74.6	28	5.0 MBITS
Microscience	HH-1090	95.8	80.1	28	5.0 MBITS
ST-506/412 (RLL)					
Microscience	HH-830	38.3	31.3	65	7.5 MBITS
Seagate	ST238R	38.4	32.7	65	7.5 MBITS
Core Int'n'l	AT32-RLL		48.7	21	7.5 MBITS
Imprimis	94205-77	77.0	63.3	28	7.5 MBITS
Miniscribe	3675	75.8	63.3	61	7.5 MBITS
Mitsubishi	MR535-RLL	76.3	65.0	28	7.5 MBITS
Microscience	HH-1060	80.0	65.5	28	7.5 MBITS
Seagate	ST277R-1	76.9	65.6	28	7.5 MBITS
Seagate	ST277R	76.9	65.6	40	7.5 MBITS
Core Int'n'l	AT43-RLL		65.7	26	7.5 MBITS
Microscience	HH-1095	112.0	95.4	28	7.5 MBITS
Rodime	RO5130R	133.0	114.0	28	7.5 MBITS
Microscience	HH-1120	143.7	122.4	28	7.5 MBITS

retrieval of that data. You may have noticed that Seagate has begun labeling some of their drives with an "R" suffix. This denotes RLL capability. This also means the surfaces on the designated drive can have data compacted and give more storage space. How much RLL it can take is up to you and the RLL controller you might buy. For the Amiga this is not important. I am not aware of any Amiga ST-506/412 hard drive controller that directly supports RLL. For those of you seeking this data compression, you have to go to SCSI. If you can be satisfied with the standard 17 blocks per track that MFM provides, then ST-506/412 is for you.

Is it SCSI or is it...?

How can you determine whether a hard drive is SCSI rather than ST-506/412? As a general rule, if the hard drive requires a 50 pin connector, then it is SCSI. If it uses two connectors, a 20 pin and a 34 pin, then it is usually a ST-506/412 type drive. An advantage to SCSI is that the SCSI host controller can handle up to seven devices daisy-chained together, while the ST-506/412 type host controller can only handle two devices. For future expansion it is obvious that SCSI has the advantage. If you decided to add a tape backup you could, with the proper software drivers, just plug it in and run it. Then if you decided to add a CD-ROM player after that, again, all you would need to do is plug it in and use it. Under the ST-506/412 format you would need an additional controller just for the third device. This SCSI expandability comes at a price, but if you look to the future it is obvious that the additional cost is minimal and worth the investment.

Any ST-506/412 can be converted to SCSI using a SCSI adapter. There are several brands on the market today. The Adaptec and the Omti adapters seem to be the converters of choice with most third party hard drive builders. C-Ltd previously used the Adaptec 4xxx series but has recently changed to the Omti 3527 converter. According to Ed Lippert, the Omti is a much faster controller than the Adaptec. The reason is that the OMTI controller allows an interleave of 1:1 while the Adaptec needs an interleave of at least 3:1.

Interleave is a handy way of making an older hard drive with slower access time appear faster than it would under normal conditions. It works in a relatively simple way. In a drive that has fast access times, it is possible to read data blocks sequentially, one right after another. With slower drive (access time) this cannot be done. The drive actually has to make one more complete revolution to read that next data block. This takes time. Interleave allows the drive read head to skip blocks so it will pick up the next data block requested by the DOS.

If you don't understand this concept then I'll try to explain. Think of the track on the hard drive as a segmented caterpillar. With 1:1 interleave the segments are in the order we would expect. Data block one followed by data block two followed by data block three, etc, etc. With an interleave of 2:1 it might look more like this: data block one, data block three, data block two, data block four. In other words, the read head "skips" a block. This also is the same way interleave would work at 3:1 or 4:1 except the data block arrangement would be different. Simply put, Interleave skips that many data blocks before it reads the second data block. The drive spin speed hasn't been increased in any way, data blocks have been re-arranged so the drive can read them without having to wait for another revolution of the platter.

Interleave is controlled by the OMTI or ADAPTEC cards rather than the host controller or the Amiga. It is set up via the low level format you must do on all drives BEFORE you do the high level

AmigaDOS format. If you will notice, the mountlist in your devs: directory always has the interleave factor set to 0 because AmigaDOS doesn't have anything to do with the low level format of the drive.

What actually does RLL do? RLL compacts data on your hard drive by formatting more blocks per track than the normal MFM encoding. MFM encoding allows 17 blocks of data per track while RLL allows 26 blocks per track. A 52% increase in blocks per track gives you a corresponding increase in data storage.

In the MS-DOS world, RLL encoding comes in three flavors, all allow data compaction. The three can increase storage by 50%, 90%, or 100%. We are concerned with the basic 50% data increase supported by the OMTI 3527 or Adaptec 4070 controller. Both these manufacturers also support the standard MFM encoding with different model controllers.

A note of caution is in order here. Manufacturers are not ones to overlook a way to make more profits. When it became obvious that their drives would support RLL encoding, Seagate and Miniscribe jumped on the band wagon and began marketing RLL specific drives. And as far as can be determined, there is no physical difference. What they did was to disable the RLL abilities of their non-specific RLL drives by a PAL in the drive controller board.

What tipped me off was this: A friend who runs a large BBS installed a Seagate ST-296 on his system about two years ago. This drive was rated at 80 MB, but by using an Adaptec 4070 controller it was able to format the drive to 120 MB with no problems. He wanted to expand his board so he went with what he knew by ordering another ST-296. He figured he would then have an additional 120 MB drive for his BBS.

He had problems. The drive wouldn't format. He eventually called me since we run the same basic equipment (C-Ltd controller to an Amiga) and thought I would be able to format it correctly. He came over and we spent about 8 hours trying to solve this problem. Finally, we gave up. It just wouldn't accept RLL formatting. I then called a friend, Nathan Barber, who is a true hardware GURU. He then explained that a PAL chip was apparently added, thus disabling the RLL capability. The only difference in the drives is that one is about two years older than the other and the added PAL chip.

HARD DRIVE SPECIFICATIONS
5.25 INCH HALF HEIGHT SCSI HARD DRIVES

MANUFACTURER	PART NUMBER	UNFORMAT CAP. (mb)	FORMAT CAP. (mb)	AVG. ACCESS (ms)	DATA TRANS/SEC
Seagate	ST225N		21.3	65	5.0 MBITS
Seagate	ST251N-1		43.1	28	7.5 MBITS
Seagate	ST251N		43.1	40	7.5 MBITS
Mitsubishi	MR535S	50.9		28	5.0 MBITS
Mitsubishi	MR537S	76.3		28	7.5 MBITS
Seagate	ST277N-1	64.9		28	7.5 MBITS
Seagate	ST277N	64.9		40	7.5 MBITS
Seagate	ST296N	85.0		28	10 MBITS
Hitachi	DK522C-10	87.5		25	1.5 MBYTES
Micropolis	1673-4	104.0	90.0	16	4.0 MBYTES
Rodime	RO5125-1F2	126.9	102.9	18	1.25 MBYTES
Rodime	RO5125S	126.9	102.9	24	1.25 MBYTES
Micropolis	1673-5	130.0	112.0	16	4.0 MBYTES
Miniscribe	3130S	130.0	115.0	17	4.0 MBYTES
Microscience	HH-3120F	121.0		18	10 MBITS
Microscience	HH-3120	143.7	122.4	28	7.5 MBITS
Micropolis	1674-6	156.0	135.0	16	4.0 MBYTES
Rodime	RO5180-1F2	177.8	144.2	18	1.25 MBYTES
Rodime	RO5180S	177.8	144.2	24	1.25 MBYTES
NEC	D5855	179.8	153.5	18	1.25 MBYTES
Micropolis	1674-7	182.0	158.0	16	4.0 MBYTES
Miniscribe	3180S	182.0	160.0	17	4.0 MBYTES
Microscience	HH-3160F	170.0		18	10 MBITS
Microscience	HH-3160	191.0	170.0	28	10 MBITS
Imprimis	94221-190	209.0	190.0	18	4.0 MBYTES

Don't think you can RLL encode a new non-RLL specific drive from Seagate or Miniscribe. You will probably run into the same problems we did. Currently, we are attempting to get more information on this. If it is simply an added PAL, it should be easy to remove it and enable RLL encoding. However, it might be a bigger project than we think. Of course, this would void all warranties from the manufacturer, but would be worth it. I'll let you know what we find.

With the new FastFileSystem introduced with WorkBench 1.3, you get an additional 5% increase in data storage. This is due to the new way AmigaDOS actually handles blocks of data along with faster data access. The FFS (FastFileSystem) now reads and writes 512 byte blocks rather than the 488 bytes per block under the original AmigaDOS.

ESDI Hard Drives

ESDI (Extended Small Device Interface) is the third type of hard drive you will see available from manufacturers. If you read the fine print that accompanies the ads for these drives, you will notice the HUGE storage capacity you can get from one of them. An example of these capacities shows that they are, indeed, getting a lot out of a very small package. Consider this: a 3.5 inch half height ESDI drive with a capacity of 110 MB, a 5.25 inch half height drive with a capacity of 383 MB, or a 5.25 inch full height hard drive with a whopping 777 MB capacity.

How is this done? These capacities are available because ESDI will allow the hard drive to use up to 16 heads, which means 16 surfaces are available to the drive. SCSI and ST-506/412 are limited to only eight heads or surfaces. This format

(continued)

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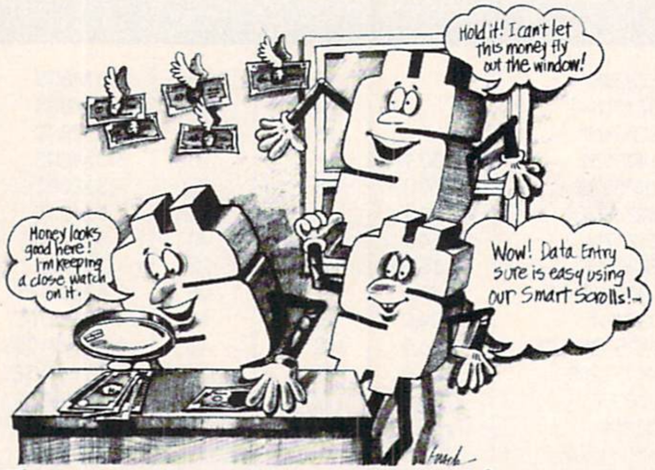
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is currently available to Amiga users thorough C-Ltd. They support the Adaptec 4520 controller, which is an ESDI controller. Other controller manufacturers have not yet committed to this interface. The primary use for these drives is as a file server for LAN networks in the PC world. Perhaps as the Amiga penetrates the business world we will see more host controllers take advantage of this interface. I know some BBS SYSOPs who would love to have this amount of on-line capacity.

For starters on the road to Hard Drive Heaven I have included several lists that you might find helpful. They are:

Hard Drive Manufacturers
Hard Drive Repair Companies
3.5 Inch Hard Drives
3.5 Inch SCSI Hard Drives
5.25 Inch Half Height Hard Drives
5.25" 1/2 Height SCSI Hard Drives

I have deliberately not included ESDI or full height hard drives. Not for space consideration but for a less confusing listing. If you would like to have that information too, I will gladly post it. Just let me know.

Please don't bother calling these manufacturers thinking you will get a better price by buying direct from the factory. It just doesn't work that way. They all sell through distributors located in various parts of the country. Don't think the distributors will give you a break either. They will generally quote you list price for a specific drive. The information they give you will be extremely helpful because they can give you specific product information. Above all else, they can tell you which retail dealer is carrying the hard drive you are looking for. The retail dealer is the one person in the chain that can and usually will give you the better price.

The product listings you see here might not include the hard drive you own or the one that your local dealer is selling at a great price. These lists include only the currently manufactured hard drives. The best prices in the stores are on the "close-out" models which are no longer being made. I would suggest that if you have the opportunity to get one of these close-out drives, do it. The quality is there, it's just there are newer models available.

Next time I plan to bring you more information on Amiga 2000 hard drive controllers, specifically, the Supra controller with a Seagate ST-157N hard drive and a Supra controller using a MicroScience HH-1060 with an OMTI 3527 SCSI adapter. Until then.... happy computing!

•AC•

Send your Hard Drive questions and comments to:

Jon A. Boulle
c/o *Amazing Computing*
P.O. Box 869
Fall River, MA 02722

Hard Drive Manufacturers

Brand Technologies
9559 Irondale Avenue.
Chastworth, Ca. 91311
(818)407-4040

Comport
3096 Orchard Drive
San Jose, Ca. 95134
(408)432-0911

Conner Peripherals, Inc.
2221 Old Oakland Rd.
San Jose, Ca. 95131
(408)433-3340

Core International
171 N. Federal Highway
Boca Raton, Fl. 33487
(407)997-6055

Fujitsi America, Inc.
3055 Orchard Drive
San Jose, Ca. 95135
(800)626-4686
(408)432-1300

Hitachi America, Ltd.
950 Elm avenue
San Bruno, Ca. 94066
(800)538-8175
(415)872-1902

Imprimis Technology (CDC)
12501 Whitewater Drive
Minnetonka, Mn. 55343
(612)936-6332

Kalok Corporation
1287 Anvilwood Rd.
Sunnyvale, Ca. 94089
(408)747-1315

Kyocera Electronics, Inc.
1000 Randolph Rd.
Somerset, N.J. 08875
(201)560-0060

Micropolis
21211 Nordhoff St.
Chatsworth, Ca. 91311
(818)709-3300

Microscience International
305 N. Mathilda Ave.
Sunnyvale, Ca. 94086
(408)730-8989

Mitsubishi Electronics
991 Knox St.
Torrance, Ca. 90502
(213)515-3993

MiniScribe Corporation
1861 Lefthand Circle
Longmont, Co. 80501
(800)356-5333
(303)651-6000

NEC Information Systems
1414 Massachusetts Ave.
Boxborough, Ma. 01719
(800)343-4418
(508)264-8000

Newbury Data Inc.
3551 Voyager St
Suite 104
Torrance, Ca. 90503
(213)370-0775

Peripheral Technology, Inc.
685 East Cochran St.
Simi Valley, Ca. 93065
(805)581-1000

PrairieTek Corporation
2120 Miller Drive
Suite E
Longmont, Co. 80501
(800)825-2511
(303)772-4011

Priam Corporation
20 West Montague Expressway
San Jose, Ca. 95134
(408)434-9300

Quantum Corporation
18 Pelham Road
Salem, N.H. 03079
(603)893-2672

Rodime, Inc.
901 NW Broken Sound Parkway
Boca Raton,Fl. 33487
(305)994-6200

Seagate Technology
920 Disc Drive
Scotts Valley, Ca. 95066
(800)468-DISC
(408)438-6550

Siemens Information Systems
1077 Business Center Circle
Newbury Park, Ca. 91320
(800)537-3866
(805)375-2500

Storage Dimensions (Maxtor)
2145 Hamilton Ave.
San Jose, Ca. 95125
(408)879-0300

Toshiba America, Inc.
9740 Irvine Blvd.
Irvine, Ca. 92715
(714)583-3000

Western Digital
2445 McCabe Way
Irvine, Ca. 92714
(800)847-5181
(714)863-0102

Hard Drive Service Companies

CNS, Inc.
21 Pine St.
Rockaway, N.J. 07866
(210)625-4056

CSR
370 North St.
Teterboro, N.J. 09608
(201)288-6655

Daisy Disc Corporation
395 Bridge Rd.
Salisbury, Ma. 01952
(800)537-DISK
(508)462-3475

Data Exchange Corporation
708 Via Alonda
Camerillo, Ca. 93010
(805)388-1711

Data Memory Corporation
6130 Variel Ave.
Woodland Hills, Ca. 91367
(800)848-3282
(818)704-9500

Distek
4545 S. Pinemont
Houston, Tx. 77041
(713)460-9650

DynService Network
18 Kane Industry Drive
Hudson, Ma. 01749
(508)568-1492

FRS, Inc.
1101 National Dr.
Sacramento, Ca. 95834
(916)928-1107

Headmaster
5400 Scotts Valley Dr.
E
Scotts Valley, Ca. 95066
(408)438-0434

KCS Computer Services, Inc.
7462 Talbert Ave.
Huntington Beach, Ca. 92647
(800)833-5833
(714)848-7971

Peripheral Computer Support
1629 South Main St.
Milpitas, Ca. 95035
(408)263-4043

Peripherals
1363 Logan Ave.
Costa Mesa, Ca. 92626
(800)468-6888
(714)540-4925

Premier Computer Corporation
8200 Normandale Blvd.
#424
Bloomington, Mn. 55437
(800)432-DISK
(612)835-2586

Restorr Magnetics
1455 McCandless Dr.
Milpitas, Ca. 95035
(408)946-9207

Sigma USA, Inc.
8717 Darby Ave.
Northridge, Ca. 91325
(818)701-7641

TRW Computer Service
15 Law Drive
Fairfield, N.J. 07006
(800)922-0897
(201)575-7110

Tektronix
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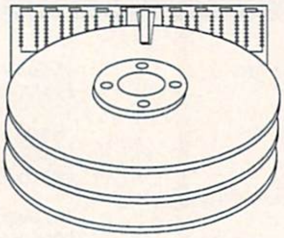

Adding a

by John P. Twardy

When I upgraded my C64 to an Amiga 500, I thought the half megabyte of memory included would be sufficient for a long time. I brought the optional battery-backed clock with the additional half megabyte of memory built in, mainly for the battery-backed clock, not for additional memory. However, in using the A500 to develop a new approach in investment software, I quickly found that the 1 megabyte of memory was actually taxed over the limit, and that the 8 full disks I needed to manage all of the files were getting very unruly. Disk swapping was consuming a lot of time and effort. I decided I needed a second disk drive, similar to my old C64 setup.

Being in the new age of computers, I figured I'd buy a hard disk for my computer. Having read many articles extolling the virtues of the hard drive, and how one could never go back to the ways of the floppy, my interest was piqued. Since the floppy drive and the hard drive were about the same price, around $200, (at least that's what it cost to add a 20 megabyte hard drive to our office XT) I figured I would spring for the hard disk.

The basic hard drive for an IBM is the same drive for the Amiga. However,—here it comes— you need a hard drive case, power supply, interface card, controller card, and cables, cables, cables. They all add up to big bucks. Trying to shortcut the packaged cost, I looked into putting together a built up system of my own.

The first choice was whether or not to put together a PC or SCSI system. I made the SCSI choice. I won't go into all of my reasons, but the two most important ones were (a) the cost was comparable and (b) the SCSI choice seemed to offer more expansion compatibility with the future (ie. optical disk drives, etc.). A year ago I didn't think I'd need more than 1 meg of memory. Now, I don't think I'll ever need more than one 20 meg hard drive, or maybe two? I'd better plan now for the WORM drive!

Before we start construction, we need to make one more choice: Do we want a system that uses the older style MFM data formatting or the newer RLL formatting that increases the storage density on your hard drive? If you've followed me this far, you know I chose the RLL format. I figured by the time I got this project off the ground and working, even the latest technology might well be on the way out.

Armed with the following, we can now start the assembly:

a. 1 Seagate ST238R 30 meg 5 1/4" half height RLL hard drive
$229 LYCO Computers

b. 1 Adaptec A4070 RLL controller,
$98 Computer Surplus Store

c. 1 Hard drive case and 60 watt power supply
$79 Wetex Int.

d. 1 Supra SCSI Host adapter
$149

e. 1 50 pin jumper cable
$12.95 DIGIKEY

The total comes to $568, $300 dollars less than the store bought variety.You could knock the price down even further by going for a 10 or 20 meg drive, a single hard drive case and power supply, and possibly even a cheaper SCSI host adapter, but look at the following built-in value.

The hard drive case, power supply and controller can handle two hard drives. Thus, for the cost of another drive (approximately $200) you can have a two hard drive system. Also, the Supra SCSI interface has room in its case for an additional 1 to 4 meg of RAM memory, and the unit passes the buss. The system that you end up with in no way compromises your future expansion capabilities—in some ways makes it too easy to spend additional money. That's one reason I like this project: You can save up your weekly allowance and buy the parts as they go on "specials", or you or your wife and friends can each buy a part for your birthday or Christmas. It seems easier to part with the money in small amounts than in one big $800 plus sum.

In addition to the items listed above, you will need the following tools: screwdriver, soldering iron, solder, two feet of #18 wire, electrical tape, voltmeter, X-ACTO knife, hacksaw, hammer and wooden chisel.

The woodworking tools make room for the Amiga and SCSI interface when attached together. If you look at the Supra ads, you will see that the total width of this combination is such that when it is installed under a typical monitor shelf, you cannot get a disk into the 3.5 drive. Thus, I cut a corner out of the middle support on my "computer work station," leaving side access to insert the disk. The hacksaw minimizes the amount of dust blown around the room during cutting. The hammer and chisel make a clean cut in the partical board when I went to remove the piece I cut loose with the hacksaw. After we protect the computer from the mess prior to starting work, and thoroughly clean the area after making the notch, we are ready to assemble the drive.

Assembling the Drive

First, remove from the bottom of the hard drive case the four screws that hold the casing in place. Partially slide the casing off. Disconnect the keyed connector from the circuit board that is connected to the "power on" light. Now remove the casing carefully.

Hard Drive

The SCSI interface connector board requires a 5v power supply from the hard drive power supply. Using the voltmeter, verify the +5v and ground leads. Splice in the two conductor 24" section of wire and tape your connection with electrical tape. Solder the two wires to the plus and minus terminals on the connector board as indicated in the instructions provided by Supra Corp. Use an ohmmeter to insure that you do not have any solder bridges.

Connect the cables to the connector board and controller card prior to installing the card. This prevents the card bending that occurs if you try to attach the cables after the card is installed. Once the card is installed, it is only supported by its sides, and pressure on the card could cause damage, especially since some of the connectors are a very tight fit.

Connector pin numbers 25 and 26 on the fifty pin ribbon cable should not be connected, per the Supra instructions. I used the X-ACTO knife to cut the two wires in the ribbon cable, and taped the ends to prevent possible shorts. Fold the ribbon cable to turn the fifty pin connector over so it will match up with the proper pin configuration at the connector board and the SCSI controller. Make the folds flat to facilitate card installation. Remove two screws securing the side card support, install the card and reinstall the side support by putting the screws back in.

Install an RF shield between the controller card and the hard drive. I used two pieces of cardboard to sandwich four layers of aluminum foil, taped on the edges. Make sure no metal is exposed, and tape the shield to the sides of the hard drive casing above the controller card. It helps if the shield is a little wider than the drive casing—it provides a snug fit and reduces the possibility of it slipping down and contacting the controller card components.

Install the hard drive by sliding it into place and inserting the eight screws that came with the power unit. I should mention that the 34 pin cable that comes with the disk drive does not have the proper end connectors.The components require that the 34 conductor ribbon cable have two edge card connectors. The cable supplied has one edge card and one pin type connector attached. The inexpensive solution is to cut off the pin connector and install a three dollar Radio Shack edge card connector.

Connect the two cables and power supply to the hard drive. Check the pin numbers to make sure that all connections are made to the proper terminals. The power supply connector is keyed. Inspect the installation carefully. Make sure all connectors are fully seated, power supplies are connected properly, and that no wires or cables are touching any of the power supply components, especially the heat producing ones (see figure three).

I taped the bottom side of the connector board with electrical tape to prevent it from shorting out on the casing assembly because the cable that runs to the SCSI interface may jiggle and cause the connector board to move inside the casing. Install the blank front piece if you are only installing one hard drive at this time. Slide the casing partially on, connect the "power on" indicating light cable, then slide it on the rest of the way being careful not to disturb the wires, cables and board. Install the four screws on the bottom of the casing.

Remove the plastic cover from the left side of the Amiga and slide the SCSI interface connector onto the edge card in the Amiga. Connect the cable from the connector board to the SCSI interface. Connect the power cord to the hard drive casing.

You are now ready to power up the system. The instructions state that in your power sequence, the hard drive should be turned on first and off last. Also, allow the drive 15 to 30 seconds to come up to speed before trying to access it. Turn on the power to all of your components and run the Supra Formatting routine provided with the SCSI interface. They didn't have a listing for the ST238 so I used the Miniscribe 8438 listing which set all of the parameters I needed automatically. The software provided with the SCSI interface is very good, as is the documentation. Among the utilities provided is CLImate, which is very useful for installing software on the hard drive. The Supra formatting software allows for five hard disk partitions, but CLImate can only handle four.

The unit formatted flawlessly. Actually the hard disk did have a bad section that the software formatted around. It's a good idea to check that the formatting picks up the same bad sectors that are identified in the test data that comes with the drive.

I loaded my WordPerfect software onto the hard disk and finished writing the article using it. The setup is one nice piece of hardware.

One final tip: Put a piece of tape over the unused host connector port on the back of the hard drive case. This prevents the cooling air from "short circuiting", or bypassing, the hard drive itself.

I would like to thank all of the people I talked with at Supra Corp., Lyco Computers, and Sunnyvale Memories for their help and information.

Good luck!!

•AC•

And the Winner is...

Amazing Computing announces the winners of the first AC Reader's Choice Awards

On March 4, 1989, Amazing Computing announced the winners of the AC Reader's Choice Awards in a speech at AmiEXPO in New York. The winners, selected by ballots completed by the readers of Amazing Computing, received a certificate in acknowledgement. Those winners who were not present will receive their certificates by mail.

The following is a list of the categories and favorite Amiga products as chosen by Amazing Computing readers.

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WordPerfect Corporation

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Software Visions, Inc.

Spreadsheet
MaxiPlan
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Professional Page
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Graphics/Paint Package
Deluxe Paint II
Electronic Arts

CAD/Draw Package
Draw Plus
Aegis Development, Inc.

Accounting Package
BEST General Ledger
B.E.S.T., Inc.

Telecommunications Software
OnLine
Micro-Systems Software

Programming Language (2-way tie)
Manx Aztec C
Manx Software Systems

Source Level Debugger
Manx Software Systems

File Utility (2-way tie)
Disk Master
Progressive Peripherals and Software

CLImate
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Animation/Video Software
The Director
The Right Answers Group

Games
Flight Simulator II
subLOGIC Corporation

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C Ltd.

Great Valley Hard Drives
Great Valley Products, Inc.

Supra Hard Drives
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Hurricane Accelerator Boards
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EEC-2520	A500	2 amp @ +5V 1 amp @ +12V	$7^{1}/_{4}$ x 6 x $14^{3}/_{4}$	Not required	$259.95
EEC-2110	A1000	None	$4^{5}/_{8}$ x 6 x $14^{3}/_{4}$	1 amp off bus *	$179.95
EEC-2120	A1000	2 amp @ +5V 1 amp @ +12V	$7^{1}/_{4}$ x 6 x $14^{3}/_{4}$	Not required	$259.95

*Call for complete information (no chain mail please).

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The MAX

by Donald W. Morgan

To begin, let's say your Amiga 1000 sports two 32 megabyte hard drives. The drives have been in operation for approximately five months, and were built using the Max kit from Palomax Inc. of Hatboro, PA.

The kit supplies no hardware, so you must purchase all the parts required to build and install the drives. The Palomax ad states you can build a 16 megabyte system for $400 using a rebuilt drive. I would say you can build a 32 megabyte system with a new drive for $525, or a 65 megabyte system for $660. To complete the Max kit you should be able to solder or wire wrap, as well as have a little mechanical ability. It's a start-from-scratch project, but not too difficult. And you can buy the parts you need in stages.

First, we'll look at the items you'll need to attach a hard drive to your Amiga. In the case of the model 2000, a case or power supply will not be needed. Everything else is essentially the same for all models.

You will need:

1. Max kit (purchased item)
2. Hard drive controller (purchased item)
3. Host adapter (build-from-scratch item)
4. power supply (purchased item)
5. hard drive (purchased item)
6. Case for interface (controller & host adapter)
7. Case for hard drive (see article)

The aluminum case holds the parts providing the interface between your Amiga and the hard drive(s). This includes the Amiga 86-pin expansion bus connector, the host adapter board, the IBM-type 62 connector the controller plugs into and, of course, the controller board. These parts can be assembled in a 7" x 9" x 2" aluminum box available at Radio Shack or other electronic supply stores.

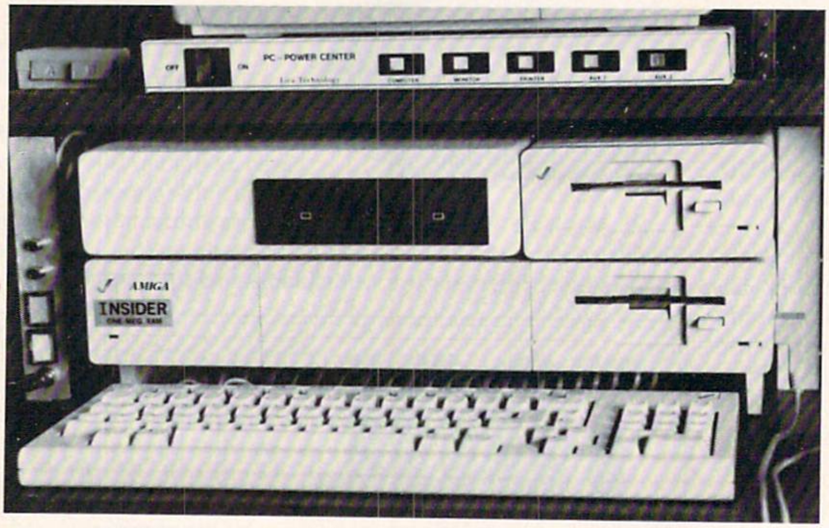
For my setup, I made a custom case with two 7" x 7" aluminum covers and two 1" wide by 1/4" thick aluminum bars which provide the spacing and support of the covers. The OMTI 5527a controller I used supports two drives, but the kit provides for two controllers so you can support four drives. For two controllers, you will need the thicker 2" case or box.

If the Amiga bus were IBM-compatible, we could wire the 86-pin Amiga edge card connector directly to the 62-pin controller connector. The small host adapter board intercepts the address lines and converts them before they go to the controller connector.

Looking at Figure one for the model 1000 and Figure two for the model 500, you can see that everything is constructed on the cover of the box. After assembly, screw the cover to the box and plug the completed interface into the Amiga expansion port. Except for placement of the host adapter board and the Amiga 86-pin expansion connector, the two models are the same.

The Max kit provides all the mechanical sketches and dimensions for the three models. I designed my host adapter a little differently, however. I feel my version is closer and more direct but, if you buy the kit, look at both and make up your own mind. I sent my suggestions to Palomax for their evaluation.

The model 2000 is built on a fiberglass board so it can be plugged into one of the expansion slots. The controller and host adapter are both attached to this board. Dimensions and wiring are provided for both Zorro I and Zorro II boards.



You can build a 32 megabyte system with a new drive for about $525, or a 65 megabyte system for about $660.

Getting to Work

The mechanical ability I mentioned earlier will be needed to make a slot in the cover for the Amiga 86-pin edge card connector used for the 500 and 1000 models. First, scribe a center line using the dimension for either the model 500 or 1000 and scribe or mark the ends of

Hard Drive Construction Kit

the slot. On the model 1000, lay out the connector slot so it won't block the 2nd joystick port.

Center punch about 3/8" apart along the center line and drill out the holes. A small round file will clean out the metal overlap between holes and a flat file will smooth out the slot. It's not as difficult as it sounds, since the aluminum is so easy to file. Try fitting the connector as you go so the slot doesn't become oversized. Once the connector fits in the slot, mark the two mounting holes, drill them, then mount the expansion connector.

Building the Adaptor Board

You are now ready to build the host adapter board. It's made on a piece of perf board with .100" x .100" hole spacing. These boards are low cost and readily available at Radio Shack or other electronic supply stores.

Figure one gives the dimensions I used for my host adapter board. The Palomax version uses a larger perf board mounted behind the controller card. The host components are 3 I.C.'s, I.C. sockets, 1 transistor, 5 resistors, and two diodes (four diodes if you are mounting two controllers). These parts should cost under $10.

Use sockets with wire wrap pins for the I.C.'s. For the other components, use push-in wire wrap posts. Radio Shack sells these push-in posts (20 posts for 79 cents) as part number 276-1987. Three posts are used for 3 for the +5, +12, and ground from the power supply.

I mounted the host adapter board with the components facing down towards the cover, and filed the mounting spacers so that when inserted, I.C.'s just touch the metal cover. This prevents any I.C. from coming loose and keeps the pins facing you for easy access. You can use a screw and three nuts on each side. One nut will hold the screw to the cover, the other two will be placed on each side of the board. Turn the bottom nut to get the top of the I.C.'s to just touch the cover. Use the other as a jam nut to lock it into place. See Figure three.

The controller card has its own mounting holes so I saw no reason to provide mounting for the 62-pin connector. The controller card is also mounted with either standoffs, spacers, or screws to the cover.

I wire wrapped to the Amiga 86-pin connector and host adapter board, but soldered to the controller 62-pin connector. Position the 62-pin controller connector about 1/2" up from the Amiga connector with the solder pins facing up. You can now wire all three together. When wired, the controller connector can be turned 90 degrees and pushed onto the controller card. You can see that most of the time involved in constructing the Max project is for wiring these three parts.

The Components

I purchased my OMTI 5527 a RLL controller from L.S.I. marketing for $68. I chose this model after reading test results published in a previous magazine article on Amiga hard drives.

The power supply I bought was a TimeLine 188 Watt switching supply which cost $25. It supplies 20 amps at +5 volts, and 4 amps at +12 volts. I didn't need anywhere near 20 amps for the 5 volts, but the price was right. The host adapter uses about .02 amps at +5 volts. The controller uses 0.5 amps at +5 volts, and 0.1 amp at +12 volts. Most half height 3.5" drives use about 1 amp at +5 and 1 amp at +12 volts. My supply had three 4-pin amp connectors. I mounted the supply on the backboard of my computer table, extending one connector to the interface box and another to the drives.

The power supply should have at least two amps per drive for the surge of the starting current in the drive motors. Check the specs of the power supply to be sure it will stand up to the starting current. There are surplus IBM-type supplies available designed for just this purpose.

The controller card has two sets of 20 connector pins and one set of 34 pins. For a one-drive system, you'll need one 20-pin and one 34-pin ribbon cable which connect the controller to the drive. I filed a small 1/16" step at the top, in line with the two sets of pins. This is where the ribbon cables will exit the interface box, so I also put tape over the step to prevent the ribbon cables from getting cut. For two drives you need another 20-pin ribbon cable. The 34-pin cable is daisy-chained to both drives. These cables are usually supplied with the drives.

I purchased my drives from Computer Products Corp. They list a 32 megabyte RLL-type for $225 as an AT Kit. It's a model 8438 miniscribe 3.5 " half height with 65 msec. average access time. If you can afford a larger capacity drive, look for the Seagate ST277R, which is a 65 megabyte RLL drive with 40 msec. average access time for $389. It bothers me to see ads in which a 30 meg drive is almost 50 percent higher in price than a 20 meg drive.

If you purchase an RLL-type controller, be sure your drive is RLL-compatible. The Palomax documentation lists a variety of drives and their compatibility.

The documentation also shows a way to pass the bus through if you need it. After wiring, the top and bottom rows of pins of the Amiga connector are bent closer together so a section of board with fingers can be soldered to the individual pins of both rows.

(continued)

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The +5, +12, and ground leads were soldered to three push-in pins inserted into the host adapter board. These wires were terminated with an amp 4-pin connector to mate with one of the short cables on the power supply. Another similar cable was run from the second power supply cable to the connector on the drives. I had to branch out the end by the drives to feed power to both drives. With one drive, you won't have to do this.

Palomax shows an optical isolated relay to supply power to the drives. I have a power control center my monitor sits on. It has surge and spike suppression, so I didn't use the relay. It's just another item to purchase, mount, and wire. After five months of fairly heavy use, my system works fine without it.

Testing the Drives

Now that the hardware and wiring are complete, you can get on with the software to set up your drive(s). The disk supplied with your kit provides all the programs to test, configure, add drivers, do the mountlist and assign alternate tracks to any bad tracks on your drive. It's almost impossible to make a drive holding 20 million or more bytes without any tiny imperfections, it's like drop outs on videotape. But, unlike videotape, you don't want your important data on a track with drop outs.

Your controller is fooled into thinking there are two less cylinders than there are. Tracks within the cylinders are reserved as alternates and assigned to the bad tracks.

Palomax does a nice job of stepping you through the software needed to set up your drive(s). You start by making a duplicate Workbench disk and deleting the utilities so there are about 100 blocks free. This freed space is where you copy the needed files from the Palomax disk to the duplicate disk.

The Testhd2.0 program has a menu of 22 items for easy selection of the test parameters. Most give an on-screen indication of error status. The defaults are selected with a press of the RETURN key. Menu item 14 assigns alternate tracks for any bad tracks on your disk. Your drive will come with a test tag showing these tracks. The HDParams and mountlist programs are in text with sample parameters. Simply backspace and type in the correct figures for your drive specifications. Ask for the specification sheet when you order your drive. I didn't receive one and had to call Palamax for help.

Technical help is available from Palamax from 6 to 9 pm (EST) five evenings a week and most of Saturday. I got through on the first try. I was stepped through each parameter as I wrote the figures next to the sample on the documentation page.

The software is set up so when you finish entering or changing the data, a simple key stroke writes the data to the controller or appropriate directory. It seems to go very fast even though I was a little apprehensive with so much money invested in something I never tried before. Except for not receiving the spec sheet with my drive, everything else worked fine.

Just in case

Once your system recognizes the hard drive and is formatted, you can think about putting it in a case. I made my case out of wood. Wood? Yes, Wood. The drive is completely encased in a metal housing so the only items that can cause any interference are the PC board mounted directly under the drive and your switching power supply if it's not mounted in a metal enclosure.

During testing, I had the first drive sitting on top of the Amiga 1000 next to the external floppy. My hi-fi receiver, two VCR's, and TV are only two feet away. I found no signs of interference or disk-operating problems with them running. If you don't feel good about a wooden case, you can line the inside of the case with foil or thin sheet metal.

By using wood, I could make the case fit the length from the external floppy to the left edge of the Amiga. Model 500 owners need not be concerned with this spacing. Model 2000 owners don't need a case.

Porting your Programs

One of the easiest ways to port your commercial programs is to make a duplicate of the Empty drawer. Expand the WorkBench window, drag the duplicate Empty to the position you want, and double click on it to open an

(continued)

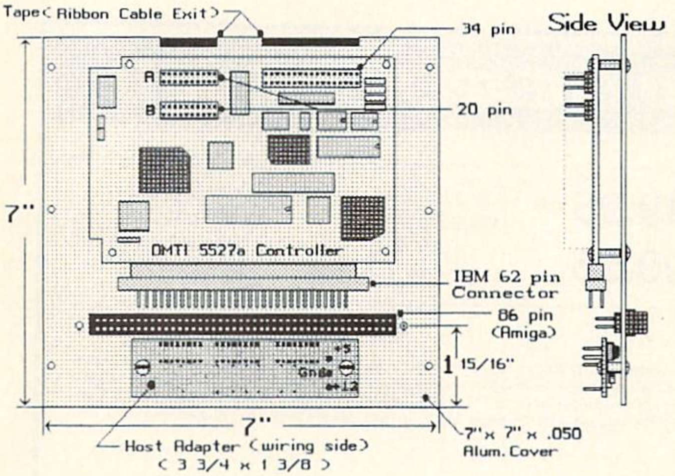


Figure One
Dimensions used for host adapter board (model 1000)

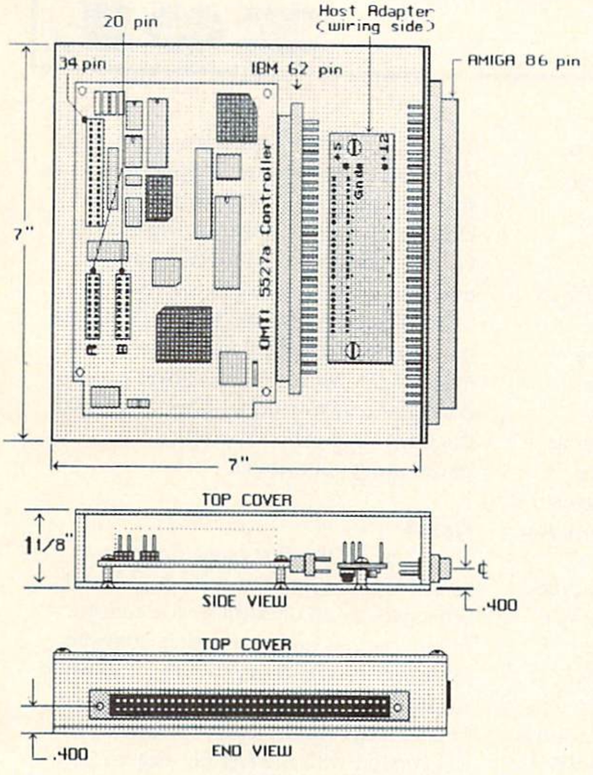


Figure Two
Dimensions used for host adapter board (model 500)

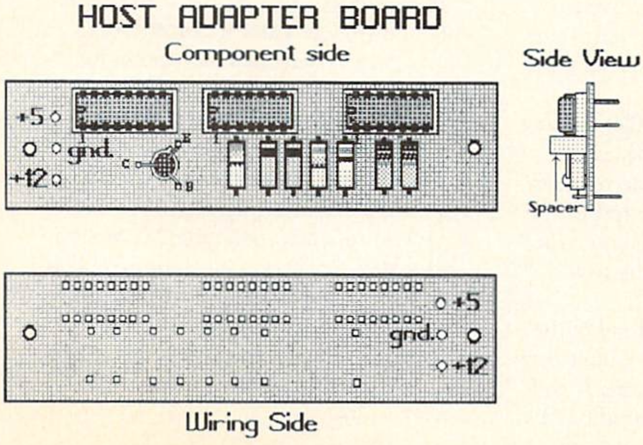
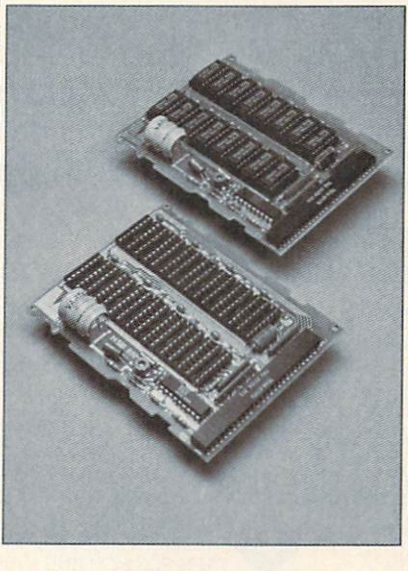


Figure Three
Spacers on host adapter board prevent I.C.'s from coming loose and keep the pins facing you for easy access.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Empty window. With the program disk in the floppy drive, open its window and drag the icons from the program disk window to your Empty window. When you finish copying all the files, select Rename and change Duplicate of Empty to DPaint or whatever disk you are trying to port to the hard drive WorkBench. Commercial floppies have some files duplicated on each floppy that you need only once on the hard drive.

There are seven main files on the Max disk. The Devs directory contains the HDParams, Mountlist, and hd.device files.The HDParams is an ASCII file that holds the parameters for configuring the hard disk(s) for the controller and HDParams1 for the optional second controller. The Mountlist is also an ASCII file for mounting the drives.Hd.device is the driver code for the first controller, and hd1.device for the optional second controller.

The "s" directory has 1, 2, and 4 drive sample startup-sequence files which you can start with or add according to your own requirements. The "c" directory contains the HDConfig, testhd, and backup files. The HDConfig file uses data from the HDParams file to configure the hd.device driver(s). The testhd file contains all the programs for testing, formatting, and assigning alternate tracks.

The backup file is just that, a backup program for your hard drives. It has options for listing files only during backup or file size and space available on the disk. There are other options for incremental backup with only files modified or created since last backup, and continuous backup from last stop point.

Two 32 meg drives?

This brings me to the point of why I opted for two 32 megabyte drives. What could be easier for backup than typing "Copy DH0: DH1: all", and no shuffling of floppies? I couldn't buy a tape backup system for anywhere near the added $225 for the second drive.

Another advantage of two drives is the regrouping of fragmented files. If you just saved your programs without deleting or modifying them, all your files would load fairly quickly. This doesn't happen in the real life of any drive. When you delete a file and later save another program, it won't fit exactly into the space the deleted file occupied. If the new file is smaller, you will have some free blocks between files. If the new file is larger, it will occupy the just-freed space and it more. This space may be in another area many blocks or tracks away from the first part.

To load the new saved file, the first part will be loaded in one block after another. The heads will have to move to the other tracks to read in the rest of the file. This scattering worsens as more files are deleted or modified and the disk becomes full.

DiskCopy will copy a clone of the original (except for date code), but Copy will copy each file, one at a time. It will take time finding all the scattered blocks and tracks, but they will be reassembled in a continuous string on the copy. With two hard drives and no floppies to shuffle around, it is easy to copy from DH0: to Dh1: to reconstruct the files. If you like the original on DH0:, you can now use DiskCopy to put the restructured files back and still have a duplicate backup on DH1:. Of course, you could do the same with a 65 megabyte drive partitioned as two equal drives. The Max documentation shows samples for partitioning your drives.

Speed!

One of the first questions that comes up on any hard drive is speed. I am currently an unemployed electronic technician, so I have no other drives to compare. I looked over a test (published in AC V3.10), of five hard drive interfaces for the Amiga 2000, using the new 1.3 version with the fast file system.

One test examined the time it took to load a video page of 704 x 480 x 16 colors in Deluxe Paint II. Most took from 4.5 to 5.6 seconds, exception for the Amiga 2090a which took 53.66 seconds. (there were some problems with DPaint and the 2090a.) I clocked loading a full page of 640 x 680 x 16 colors at 5 seconds (my electronic timer is only in seconds), with the 2.0 version of the Max software. I have the new Max 3.0 driver software but am still waiting for my order for the Amiga V1.3 Enhancement disks with the fast file system. Palomax claims over a 3X increase in

(continued)

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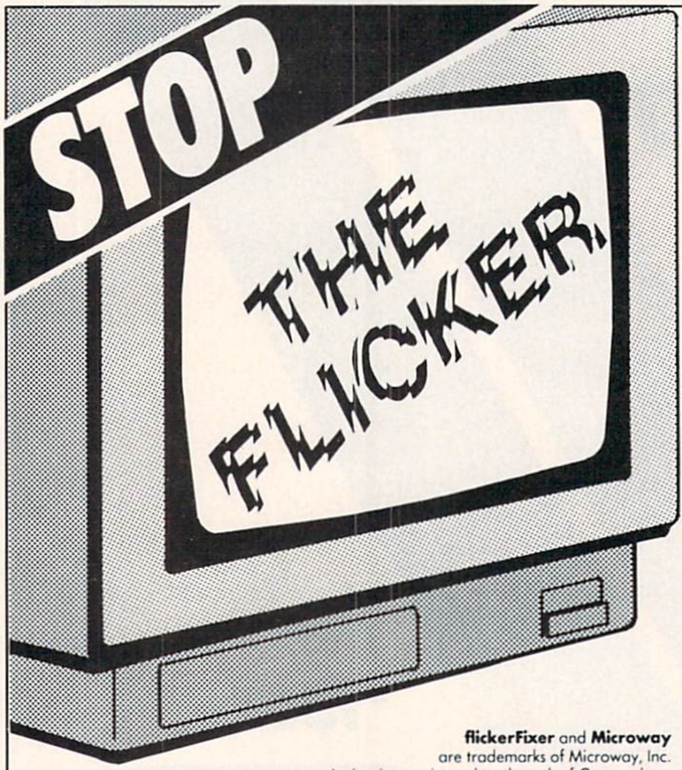

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reading speed, and a 5X increase on writes with the new driver and the Amiga fast file system.

Here is where my dual hard drives will also be handy. You must reformat your hard disk to use the fast file system. With a complete backup on one drive, I can format for the FFS, then copy my files over from the backup while I relax and watch TV. For one drive, I recommend setting it up as two partitions, using one partition for backup until you need the added space.

Compatibility

As for compatibility , I can only vouch for the components I am using. My system has the KickStart Eliminator from CMI and the Insider 1 meg memory expansion from Michigan Software. I use Addmem in my startup-sequence to reclaim the 256K in the protected write control store area for the KickStart disk.

I have a four-way parallel switch box for a Toshiba P321SL printer, Canon PJ1080a color ink jet printer, Perfect Sound audio digitizer, and Digi-View video digitizer. After 5 months of operation, I have found no problems using the drives with any of my peripherals. I did crash my first drive trying to port some of my copy-protected software to the hard drive. Deluxe Paint was easy to transfer to the hard drive, but Deluxe Print crashed it. Deluxe Paint II should fix this.

Another advantage to building the Max kit is the ability to upgrade whenever you want. The controller will handle two drives, so you can start with one drive and expand to two later on. Adding a second controller will give you the capability of four drives. (Imagine having four 65 meg drives under the Amiga hood.) Even if you purchase one drive, set up the software for the second. This will make it easy to add another later on if you change your mind.

The Max kit does not autoconfigure, but it does have a fixed base address of F7FFE0 which, according to Palomax, is Commodore's production test diagnostic area. Since this address is decoded for you, I don't see any disadvantage to Max not being autoconfiguring.

Besides its speed and capacity, I find the biggest advantage of a hard drive is having a full WorkBench screen with all my programs and utilities just a double click away. It also eliminates the chore of preparing data disks and flipping through a stack of floppies to find that needed program. On the other side of the coin, you must get organized and set up your directories and subdirectories right from the beginning or you'll wind up with a large string of jumbled programs.

When the Amiga was designed, developers thought about tomorrow but not the day after. The release of KickStart 1.3 will bring the possibility of auto booting. Software houses are starting to take hard drives into account in their new programs. Things are looking up. I feel the minimum configuration for an Amiga should be at least a 30 megabyte hard drive and 2 meg of RAM, with the floppy used for porting newly acquired programs to the hard drive and playing games.

Once you have a hard drive on your system you can shift out of low gear and get into the fast lane.

•AC•

Bug Bytes

The Bugs & Upgrades Column

by John Steiner

One of my greatest interests is desktop publishing. I have used the Amiga as a desktop publishing tool since its early days, and have used both IBM compatibles and the Macintosh as well. Recently, I was appointed chair of the DEPOT (Desktop & Electronic Publishers Online Terminal), a desktop publisher's support group on PeopleLink.

For years, I have kept watch on the slow progress of the Amiga as a desktop-publishing tool, so I was interested to find that PageStream, from Soft-Logik Publishing, has finally been released. I use the term finally because it has been over a year since I first saw advertising for the program.

Judging from information I have seen regarding the program, and from my own limited experience, PageStream appears to have several major bugs. I have listed them here along with a few workarounds, and some things to avoid, lest you enjoy frequent visits to the Guru.

Before getting down to the bug list, which I find amazingly large for a commercial release, I would like to comment that, although there may be a negative tone to this report, users who have reported these bugs are almost universally tempering their negative comments with glowing praise for the power and desktop publishing features of this program.

But it appears the program might not have been ready to be delivered. Commercial software should never routinely guru the computer. And from the reports I have received, there are several things that can bring on the Guru.

The following bugs have been reported by at least two different individuals. There were many more bugs reported but, as I was not able to verify them before deadline, I gave the program the benefit of the doubt and attributed these difficulties to new user errors. I have obtained a copy of the program and verified many of these details for myself. In the meantime, the workarounds listed here will hopefully save PageStream users many hours of lost work.

Several users have reported, and I verified, that rulers leave ghost "tic" marks on the X and Y axis as various actions occur. This makes it confusing to determine where the cursor is. To work around this problem, go to the View menu and choose the same function that was already checked. This causes the program to redraw the screen, which will remove the invalid ruler marks. You can also remove these invalid marks by clicking on the rulers themselves.

Several users reported problems with the variable zoom tool. If you click the zoom tool too quickly, you will be off to see the Guru. A couple of users reported that if you press and hold the mouse button, then drag the mouse slowly, the zoom works properly.

Other users said even this didn't help, and trying to use the zoom tool was never successful. In the short time I have played with the program, I couldn't get the zoom tool to crash. But I have a 3 MB computer , so it is possible the crash occurs when zoom calculations run a machine out of memory.

The program appears to grab at least 10K of chip memory every time it is run, which it does not release when the program is finished. The only way to get the 10K of RAM back is to reboot the computer. This is not a major problem if you reboot on floppy every time you run a different application.

Users with hard disks, who expect to go back and forth between applications, should keep PageStream running in the background and use multitasking if they have enough memory.

The supplemental dictionary has a problem with the Add Word function. According to several users, if you try to add a word to the dictionary, you will make an unscheduled trip to the Guru. The only workaround to this bug is not to click on the Add gadget. I verified this bug myself.

When rotating or sizing an object, make sure the object remains entirely on the working page. Should you let objects fall off the edge of the page, unusual things may occur.

If you interrupt the printer, you may be off to see the Guru. I would also recommend that you save your document before doing any printing. In fact, judging from comments by PageStream users, save your document often just to be on the safe side.

At least one of the disk requesters with a slider gadget would not let you slide it back to the top again once it had been slid all the way down to the bottom. However, the up arrow works to bring the slider back up again.

Judging by the quantity and severity of these bugs, I am not impressed with SoftLogic's quality control. Hopefully it will not be long before they have a much smoother release ready to be put to productive use. If Professional Page hasn't improved their dot-matrix output by that time, I will be changing desktop publishing programs. Until then, I plan to wait and see what happens.

Soft-Logik Publishing Corporation
P. O. Box 290071
St. Louis, MO 63129

(continued)

I have been using Click DOS, a shareware disk utility. After using it extensively, I decided to send them my $15.00 shareware fee (which was certainly reasonable). Gary Yates, author of the program, graciously shipped me the latest version, numbered 2.06., and also warned me of a bug in the previous 2.04 version. It is a particularly nasty bug so, if you are using version 2.04, you might want to get an upgrade.

The Move command did not work properly. It did not bother me too much in that, after copying the files to the destination directory, it would not delete them from the source directory. This did not seem to be a major problem to me untill Mr. Yates reported that if the copy failed for whatever reason, the source files were deleted! How fortunate I was to have never had the copy fail.

According to a newsletter published by Oxxi, Inc., if you are a Maxiplan version 1.8 or 1.9 user, and have problems with garbage on the screen, see if you are using FastFonts, which automatically executes in most 1.3 startup-sequences. According to the notice, "It seems that starting somewhere in the various releases of MaxiPlan 1.8, it ceased to get along well with FastFonts. We are not sure why, except that it contains some code which performs the same functions." If FastFonts automatically executes in your startup-sequence, you should remove it until a bug fix or patch to MaxiPlan is released.

Oxxi, Inc.
P. O. Box 90309
Long Beach, CA 90809-0309
(213) 427-1227

Registered users of Lattice version 5.0, you will have already received version 5.02 by mail. The no-charge upgrade is a minor bug fix. If you have not received your upgrade disks and are a registered user, contact Lattice directly.

Lattice
2500 S. Highland Ave.
Lombard, IL 60148
1-800-533-3577

If all goes according to schedule, Professional Page by Gold Disk will have been upgraded to version 1.2 by the time you read this. Version 1.2 is designed to import Professional Draw files. Professional Draw is a well-structured drawing program that has the finest dot-matrix output I have ever seen. We will have to wait until version 2.0 of Professional Page to see the same kind of dot-matrix output as Professional Draw. Other changes to Professional Page release version 1.2 include Color Postscript output, a sorting file requester, and numerous bug fixes.

Gold Disk, Inc.
P. O. Box 789
Streetsville Mississauga ON
Canada L5M 2C2
(800) 387-8192

Charlie Heath of MicroSmiths, Inc. has a unique program that allows TxEd Plus owners to upgrade to BlitzDisk V2.0. The new version of BlitzDisk will allow you to use BlitzDisk with FFS hard disks. It has several other new features including better statistics reporting, more control over parameters for individual drives being cached, and a HOLD keyword which allows you to specify that floppy disk buffers should be retained if the diskette is removed, then reinserted.

You can download the update program from the Amiga Zone on PeopleLink, or from other services. To use the update program (BDFIX1.ARC), you will need your original registered TxEd Plus master diskette (V2.00 or V2.01). Mr. Heath deserve a tip of the hat. This unique upgrade program provides an inexpensive way to provide upgrades to the user, and save everybody money in the process. If you have questions about either of these programs, contact :

Microsmiths, Inc.
P. O. Box 561
Cambridge, MA 02148
(617) 354-1224

I received a letter from Custom Services, makers of System Test Utility. STU is now in release version 4.0, and version 3.0 users can upgrade to the new version by sending their original disks. There is no charge for the upgrade. Users of earlier versions must pay an upgrade fee of $5.00. Either upgrade has a $3.00 shipping and handling charge. STU is a diagnostic utility which checks for faults in floppy and hard disks and memory in the Amiga. The program lists for $29.95.

Custom Services
P. O. Box 254
Morrestown, NJ 08057
Attn: Diagnostics

A new version of Nag is available. The program, written by R. L. Stockton, was originally shareware. Gramma Software has released an upgraded commercial version to this top-notch Amiga Appointment Calendar software. Registered shareware users have received an inexpensive upgrade thanks to Mr. Stockton. There are rewards to paying shareware fees.

That's all for this month. If you have any workarounds or bugs to report, or if you know of any upgrades to commercial software, you may notify me by writing to:

John Steiner
c/o Amazing Computing
P. O. Box 869
Fall River, MA 02722

...or leave EMail to

Publisher on PeopleLink

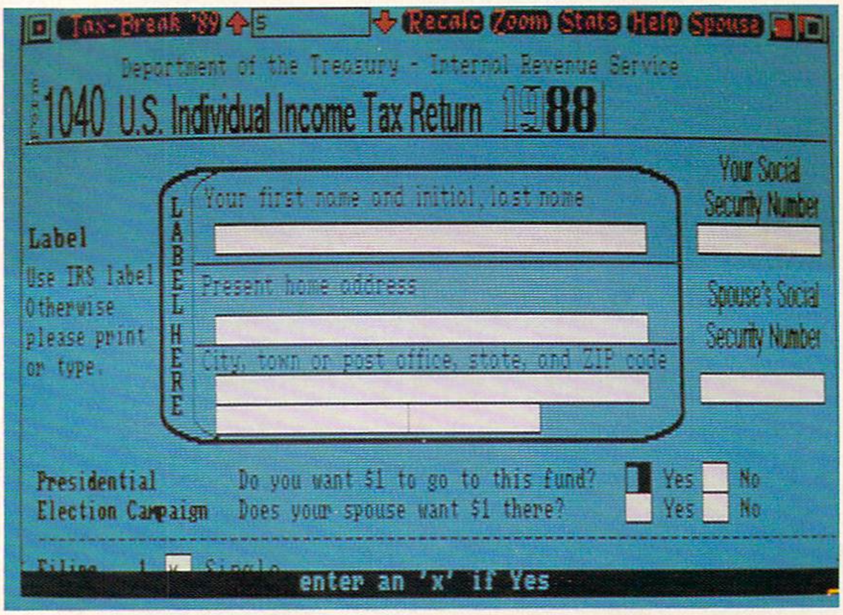
or

73075,1735 on CompuServe

•AC•

TAX BREAK

by Kim Schaffer



Department of the Treasury - Internal Revenue Service

1040 U.S. Individual Income Tax Return 1988

Label
Use IRS label
Otherwise
please print
or type.

LABEL HERE

Your first name and initial, last name

Present home address

City, town or post office, state, and ZIP code

Your Social Security Number

Spouse's Social Security Number

Presidential Election Campaign Do you want $1 to go to this fund? ☐ Yes ☐ No
Does your spouse want $1 there? ☐ Yes ☐ No

Filing 1 x Single

enter an 'x' if Yes

Figure One

Although the screen comes up a little slow, but sooner or later it's there—on your screen in living color: your 1040 worksheet. Exciting!

Waiting for the last minute to get your taxes done this year? If you're like me, you need something to make that yearly duty a little more bearable. So how about a program to make sure you don't transpose the numbers from your calculator to your Schedule A? Tax Break has a lot of checking and double checking built-in, so you can rest a little easier with the calculations, and concentrate instead on getting all those deductions.

Tax Break can definitely speed up tax filing, especially if you get conned into doing taxes for Aunt Lou, or Cousin Betty Sue. It can also provide relief that spouse who fears adding all those big numbers on that little scrap of paper, then losing the sum before you get a chance to copy it down. If you have the memory (2MB), and the patience, Tax Break can do up to eight Federal tax returns at the same time. That's way past my limit, but maybe it's just enough for the "power" tax preparer.

Not quite as shiny as a Lamborghini at showtime, this program still has a lot of polish. Although the screen comes up a little slow, but sooner or later it's there—on your screen in living color: your 1040 worksheet. (OK, so tax forms may not be something you consider to be terribly exciting.) Tax time still makes the heart flutter, and it helps to have a program that's not just a backyard hack.

The program starts up with the input on the label area of the 1040. Here I thought they had things backwards. While it makes sense to start from the beginning, after reading the manual, one is inclined to do differently. Start off with the W-2 worksheet instead, as the manual suggests. It's laid out, just waiting for you to use it. The keyboard shortcut to the W-2 worksheet is Amiga 1 (the shortcut to the1040 is Amiga 2).

The worksheet even tells you what box number of your W-2 to look to for the input. Tax Break can also handle multiple W-2's, up to four per person. So, although I didn't particularly like the order Tax Break started with, that didn't make me like the program any less because you can fill out the forms in any order you please, jumping around and even overriding the links.

Tax Break provides lots of help through a status line, the use of zeros, and the old double clicking for those connections to other worksheets. The status line displays an asterisk whenever there are IRS tax preparation instructions available for that line. When you get to a line you don't understand, just push the Help key, and the instructions for that line are displayed. When you have read enough, hit the "escape" key, and you're back in business.

The status line also includes information such as where to look for inputs and what worksheets, forms, or schedules support that line. Any line that uses other lines will have a number in it, even if it is just zero. You can also see the equation for those cells by using the F8 key.

The last but perhaps most helpful tip is that when you double click the cells which use another sheet, Tax Break will load that sheet for you and show you where it needs the information to fill that line. How do you know if the cell uses another sheet? Read the status line! These are all tricks that would probably take you a while to pick up on unless you read the manual or, better yet, this article.

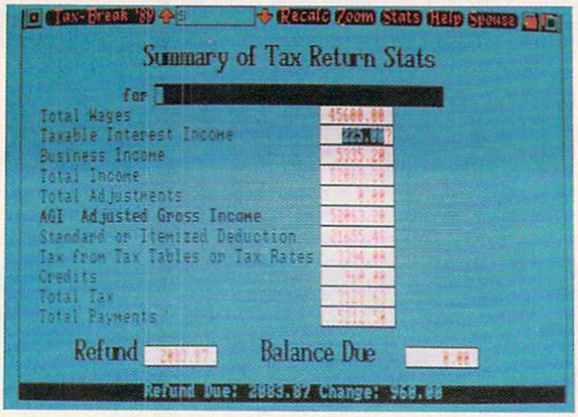
The Tax Break Program

The program consists of over twenty-five schedules, forms, and worksheets that are linked together so you never need to manually copy anything from one line to another . The program is also organized so you can keep your eye on that "bottom line": it recalculates every time you go from one form to another, to give you the present tax situation, and how much it has changed from last time. You can also force a recalculation at any time, to allow for "what ifs". There's even a summary worksheet to give you the major calculations.

After you become familiar with the program and are satisfied that it really does look good, but you want a little extra speed, you can dump the glitz and

(continued)

Figure Two *(left)* ***Tax Break*** *offers a summary worksheetso you can keep your eye on that "bottom line"*



Summary of Tax Return Stats

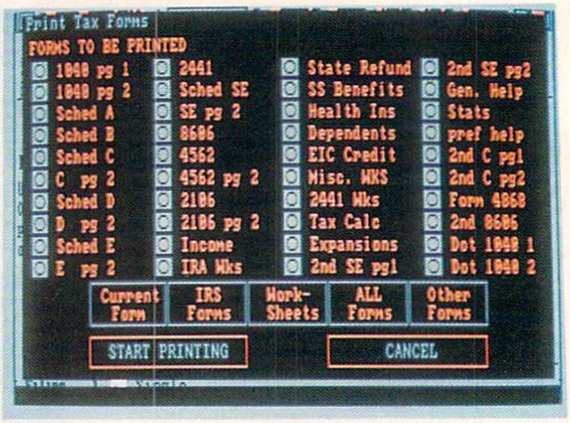
for

Total Wages	45600.00
Taxable Interest Income	[illegible]
Business Income	5335.20
Total Income	[illegible]
Total Adjustments	0.00
AGI Adjusted Gross Income	[illegible]
Standard or Itemized Deduction	21655.40
Tax from Tax Tables or Tax Rates	[illegible]
Credits	[illegible]
Total Tax	[illegible]
Total Payments	[illegible]

Refund [illegible] Balance Due 0.00

Refund Due: 2083.87 Change: 968.00

Figure Three *(right) Following IRS forms, printouts are quickly and easily produced.*



Print Tax Forms

FORMS TO BE PRINTED

- ○ 1040 pg 1
- ○ 1040 pg 2
- ○ Sched A
- ○ Sched B
- ○ Sched C
- ○ C pg 2
- ○ Sched D
- ○ D pg 2
- ○ Sched E
- ○ E pg 2
- ○ 2441
- ○ Sched SE
- ○ SE pg 2
- ○ 8606
- ○ 4562
- ○ 4562 pg 2
- ○ 2106
- ○ 2106 pg 2
- ○ Income
- ○ IRA Wks
- ○ State Refund
- ○ SS Benefits
- ○ Health Ins
- ○ Dependents
- ○ EIC Credit
- ○ Misc. WKS
- ○ 2441 Wks
- ○ Tax Calc
- ○ Expansions
- ○ 2nd SE pg1
- ○ 2nd SE pg2
- ○ Gen. Help
- ○ Stats
- ○ pref help
- ○ 2nd C pg1
- ○ 2nd C pg2
- ○ Form 4868
- ○ 2nd 8606
- ○ Dot 1040 1
- ○ Dot 1040 2

still keep a very powerful tool. The interface is everything you would expect from an Amiga program: help menus to get you going, mnemonic short cuts once you get used to the program, and even a few gadgets for some of the more useful functions right up front. In fact, by the end of the tax preparation, you will probably know the ins and outs of the commands so well, you will want to attempt different approaches, do someone else's taxes, or just forget taxes completely until next year.

Tax Break is well organized. Still, you need to read the manual to find the method and the tricks that make it a powerful tool. The manual is much better reading than the 1040 instruction booklet, although it could be a little better organized. The manual does not try to substitute itself for the tax instruction booklet, concentrating instead on familiarizing the user with the program. Oxxi has included the tax preparation instructions, and the Price Waterhouse Personal Tax Advisor paperback to help you get organized for the job. Tax preparation is confusing, and I haven't seen anyone make it more comprehensible than Tax Break.

Loopholes

Did I find any shortcomings in this program? What self-respecting reviewer wouldn't find some "bugs" or "features" (depending on what side of the fence you are on) to report. Yes, I found a few, but most were nitpicks. Overall, the program seems to be a mature piece of software. That makes sense, since the people at Oxxi told me Tax Break had been on the market in Canada for a couple of years now.

The biggest shortcoming I found was the lack of a worksheet for personal interest. To be fair, the IRS doesn't include one either, but I had to call up my spreadsheet program in the background to document my numbers, and then copy the total back to Tax Break. Also, while the calculator will insert the actual total when you use the F4 key, it will round off to the nearest dollar if you use the mouse. And loading a file, such as data for a spouse, always requires clearing all the memory. Still, the program hasn't bombed out on me yet, and there are not many programs I can say that about.

The program is a little hard on the memory, but there are a lot of different tricks to allow you to do some multitasking, even on 512K machines. The program can also use the Workbench screen if you need to save memory. In fact, the program seems to be able to switch back and forth between screens automatically, depending on the memory situation. Also, as mentioned before, you can choose not to load background pictures, which the program doesn't really need.

Printing

What about those printouts? The IRS requires a graphic type output for the 1040 form and, again, Tax Break comes through (although not quite unscathed). I tried two different printers, a 24 pin Toshiba and an HP Laserjet. The manual and an addendum left little doubt what printer settings should be used to obtain the best output. Even with the Workbench 1.3 drivers, printing the final 1040 worksheet was painfully slow, especially on the HP Laserjet.

I was also surprised that the dot matrix printer output seemed faster, cleaner, and produced a better looking image. The Laserjet output was higher resolution, but looked as though it had been through a fax machine. The dot matrix seemed a little smoother, and it was my final choice for sending to the IRS. The rest of the printouts were in standard text format, following the IRS forms, and were quickly and easily produced.

Once you've finished printing all your forms and have mailed in your '88 taxes to get that big, juicy refund check, you're ready for the next step — estimating your 1989 taxes. Tax Break does its best to help you here also. In the first menu, sitting right above the "Quit", is the "Open a 1989 Tax Planning Return" option. This changes the program to allow for changes known for the 1989 return. It also includes an "inflation factor", which can be useful if you expect a "inflation" of income and expenditures. Now if only it would tell me how to fill out a W-4, I'd be in business!

Updates

Oh well, that brings me to the final topic I wanted to mention —the future of Tax Break. I think this program is here to stay, and evidently so does Oxxi. One of the first questions I asked about the program was, "Do I have to pay the full price every year?" If this was the case, I didn't think it would be worth it. However, the answer was a resounding "future versions will be considered upgrades, and will be available to registered owners for the usual update fee, presently $29.95 + $4 shipping." This made it very attractive indeed.

In addition, the manual states "1989 Tax Break will incorporate even more forms, an even more user- friendly interface, and will integrate with tax returns for several of the highly populated states." So, if you've been good, you probably deserve a Tax Break.

•AC•

Corrections & Additions to

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The largest collection of fonts and clip-art available for the Amiga today. 110 different fonts are included in this 20 disk set. Also included are 141 hi-res pages of border clip-art. 4 disks of ColorFonts and 2 disks of Brushes round out the set. A must for the video professional. $199.00 *ARock Computer Software*

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Cookbook Video
An excellent basic video instruction course for the Sculpt-Animate series of programs. To fill in some of the Knowledge gap, Byte by Byte has produced a low cost, low hype, introductory instruction course to the Sculpt-Animate series of products. Viewing this tape prior to purchasing a 3D modeling program answers most of the more difficult questions about 3D. Once you have the modeler, the video is great hands on training. $24.95 *Byte by Byte*

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Byte by Byte
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9442 Capital of Texas Highway North
Ste 150
Austin, TX 78759
(512) 343-4357

Programmers Guide To The Amiga
Written by Amiga's manager of technical documentation. Covers a wide range of topics and complements the Amiga ROM Kernel Manuals. Written for the C language, but offers source/object disks for Lattice/Manx C and Modula-2. Book: SYBEX (or DATAPATH); diskettes: DATAPATH $24.95 *DATAPATH*

Source/Object Diskette for Programmer's Guide To The Amiga
Source and object code from the Programmer's Guide To The Amiga, available in Lattice/Manx C, TDI Modula-2, or Benchmark Modula-2. Specify format when ordering. Special pricing on book/diskette combinations. Write for details. $15.00 *DATAPATH*

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Contains source and object in both C and Modula-2 to simplify direct access to the audio device. No licence required for use. $8.00 *DATAPATH*

DATAPATH
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(619) 673-0759

(continued)

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Amiga 2000 Hard Disk SCSI/RAM DMA Autobooting Controller with 2MB Max. RAM Expansion; Zero RAM Installed. $360.00 *GVP*

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Amiga 2000 Hard Disk SCSI/RAM DMA Autobooting Controller with 2MB RAM Expansion Installed. $995.00 *GVP*

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Amiga 2000 Hard-Card20. 20MB SCSI Hard Drive mounted on SCSI Autoboot, DMA Controller. $675.00 *GVP*

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Amiga 2000 Hard-Card30. 30MB SCSI Hard Drive mounted on SCSI Autoboot, DMA Controller. $775.00 *GVP*

IMPACT A2000-HC/40
Amiga 2000 Hard-Card40. 40MB SCSI Hard Drive (28ms avg. access) mounted on SCSI Autoboot, DMA Controller. $899.00 *GVP*

IMPACT A2000-HC/45
Amiga 2000 Hard-Card45. 45MB SCSI Hard Drive mounted on SCSI Autoboot, DMA Controller. $950.00 *GVP*

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Amiga 2000 Hard-Card40Q. 40MB Quantum SCSI Hard Drive (19/11ms Avg. Access) mounted on SCSI Autoboot, DMA Controller. $999.00 *GVP*

IMPACT A2000-HC/80Q
Amiga 2000 Hard-Card80Q. 80MB Quantum SCSI Hard Drive (19/11ms Avg. Access) mounted on SCSI Autoboot, DMA Controller. $1450.00 *GVP*

IMPACT SQ44
Syquest 44MB Removeable Hard Drive (25ms) without Cartridge *Includes GVP Advanced Autoboot EPROM Kit with Removeable Media Support. $1299.00 *GVP*

SQ400 Cartridge
44MB Syquest Disk Cartridge. $139.00 *GVP*

A2000-FD2010
Amiga 2000 3.5" Internal Floppy Disk Drive with Commodore color bezel, mounting hardware and dust door. $179.00 *GVP*

30MB Seagate Bundle
A2000-2/0 bundled with 3 1/2" SCSI ST138N, $850.00; A2000-2/2 bundled with 3 1/2" SCSI ST138N includes 2MB RAM Installed, $1425. *GVP*

40 MB Miniscribe Bundle
A2000-2/0 bundled with 3 1/2" SCSI 8051S (28ms avg. access), $949.00; A2000-2/2 bundled with 3 1/2" SCSI 8051S includes 2MB RAM Installed, $1499.00. *GVP*

40MB Quantum Bundle
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48MB Seagate Bundle
A2000-2/0 bundled with 3 1/2" SCSI ST157N, $995.00; A2000-2/2 bundled with 3 1/2" SCSI ST157N includes 2MB RAM Installed, $1549.00 *GVP*

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A2000-2/0 bundled with 5 1/4'" SCSI ST277N, $1075.00; A2000-2/2 bundled with 5 1/4'" SCSI ST277N includes 2MB RAM Installed, $1649.00 *GVP*

80MB Quantum Bundle
A2000-2/0 bundled with 3 1/2" SCSI ProDrive 80S, $1499.00; A2000-2/2 bundled with 3 1/2" SCSI ProDrive 80S includes 2MB RAM Installed, $2099.00 *GVP*

IMPACT A500-HD/20M Subsystem
Amiga 500 20MB Hard Drive System Includes: SCSI Cntrl, Power Supply, Fan, RAM Expan. Slot & Chassis (Miniscribe HD; 60ms avg. Access). $769.00 *GVP*

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Amiga 500 20MB Hard Drive System Includes: SCSI Cntrl, Power Supply, Fan, RAM Expan. Slot & Chassis (Miniscribe HD; 40ms avg. Access). $775.00 *GVP*

IMPACT A500-HD/30 Subsystem
Amiga 500 30MB Hard Drive System Includes: SCSI Cntrl, Power Supply, Fan, RAM Expan. Slot & Chassis. $875.00 *GVP*

IMPACT A500-HD/45 Subsystem
Amiga 500 45MB Hard Drive System Includes: SCSI Cntrl, Power Supply, Fan, RAM Expan. Slot & Chassis. $1095.00 *GVP*

IMPACT A500-HD/40Q Subsystem
Amiga 500 40MB Hard Drive System Includes: SCSI Cntrl, Power Supply, Fan, RAM Expan. Slot & Chassis (Quantum HD 19/11ms Avg. Access). $1195.00 *GVP*

IMPACT A500-HD/80Q Subsystem
Amiga 500 80MB Hard Drive System Includes: SCSI Cntrl, Power Supply, Fan, RAM Expan. Slot & Chassis (Quantum HD 19/11ms Avg. Access). $1650.00 *GVP*

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16MHZ Motorola 68882 Math Co-Processor. $369.00 *GVP*

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Transforms your Amiga into a communications workstation comparable to high-end systems costing thousands of dollars. Features online conferencing between 32 users, Private E-Mail, Word processing functions, 65,535 Security access levels, 40 file libraries and message bases, Xmodem, Xmodem/CRC and Ymodem protocols supported. Works with Amigo Business Computers' ComPorts serial card. $349.00 *InterCore Development Systems*

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Over 150 recipes for beverages, breads, breakfast, desserts, entrees, salads, sandwiches, sauces, soups, vegetables and miscellaneous. Home (Standard)

(continued)

version offers directions and unit amounts for home cooking, and Quantity offers Institutional style cooking. Disk $14.95 Book $25.00 *Meggido Enterprises*

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An alternative to the Amiga A501 internal expansion RAM. Uses One Megabit DRAM technology to reduce card size by half, minimizing transmission line effects and giving greater noise protection. Consumes 8 mA with a maximum of 20 mA when the board is being continually accessed— a big plus for power-conscious A500 owners. Includes a battery-backed Real Time Clock. $199.00 *Memory and Storage Technology, Inc. M.A.S.T*

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(312) 480-7667

MAX Hard Disk Construction Project
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Hatboro, PA 19040
(215) 672-6815

PrintScript
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NOrthboro, MA 01532

Thinker
Idea Processor combines a word processor, Hypertext and a hierarchical text processor. Can be used as a writing tool, a planning tool, or even a database.Easy to learn, with step by step tutorials. Introductory price of $59.00 until April 1989 $79.00 *Poor Person Software*

Poor Person Software
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Palo Alto, CA 94306
(415) 493-7234

Mouse Master
Switch box lets you instantly select either your mouse or joystick in Port 1. Also brings out Port 2 to make all ports easily accessible. Requires no separate power supply and comes with a 26" non-detachable double cable that plugs directly into both ports. Custom molded in gray. $39.95 *Practical Solutions, Inc.*

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High-speed, split-screen game where two players blast through 22 levels of action to reach the evil central computer. Impossible to beat on your own. $29.95 *Psygnosis Limited*

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Pilot a realistic but playable F-16 simulation. Controls, head-up displays, and radar conform to current avionics of the F-16A. Go head-to-head against an opponent on a second Amiga. $49.95 *Spectrum Holobyte*

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AmiEXPO

New York, March '89

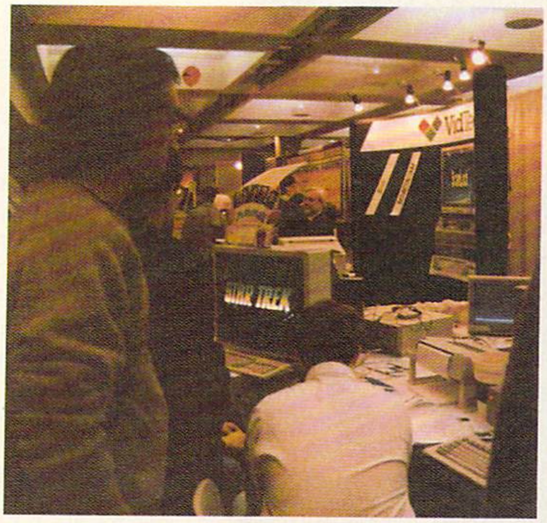
New York! The Big Apple! 1989! The Amiga opened on Broadway March 3 to 5 and, while reviews were mixed, the box office numbers could not be ignored. Over three days, more than 11,800 poured into the second AmiEXPO NY , filling the corridors of the Marriot Marquis in Times Square with a new breed of Amiga folk.

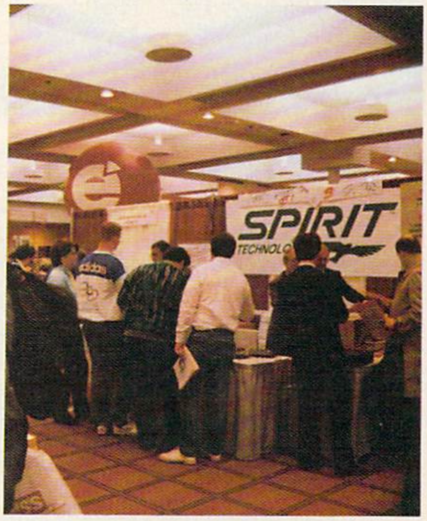
Many of the attendees were certainly recognizable from previous shows. However, vendors did notice some significant changes in the attendees. AmiEXPO officials had targetted college campuses, as well as, the professional video community, with a substantial direct mail effort, and the crowd reflected this. Professors and grad students stood elbow to elbow with directors, cameramen, and more than sixty members of the world press. Here's what they saw.

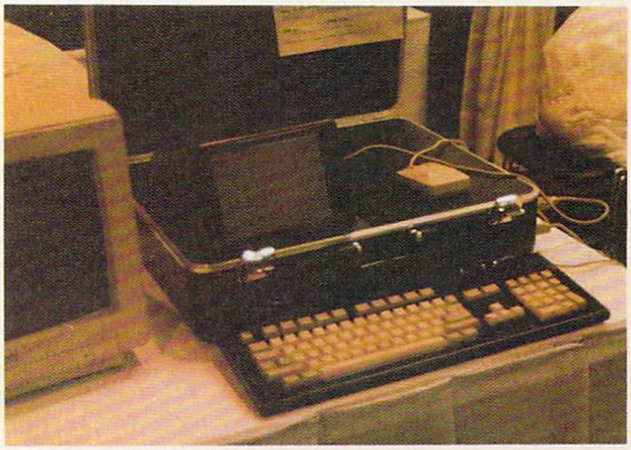
NewTek showed off Digi-Paint 3, a completely new version of the Amiga's first HAM paint program. Digi-Paint 3 includes full Amiga font support with anti-aliasing of text, an extended set of drawing tools with resizable built-in brushes, and user-controllable 3D texture mapping. You can now control the amount of brush warping, the "warping point" of the brush, and the brush transparency.

Digi-Paint 3's interface has been completely redesigned by noted Amiga artist Jim Sachs. New display features include autoscrolling bitmaps up to 1024 by 1000 pixels, user-definable overscan, and changing screen resolutions on-the-fly.

Other program features include new drawing modes, an improved magnify mode, a larger palette area, unlimited brush resizing with anti-aliasing, brush rotation, and range painting. Written in 100% assembly code, Digi-Paint 3 has a complete set of keyboard shortcuts. The new version is extremely fast. You can navigate between the various drawing modes more easily than before, load fonts from any disk without assigns, and upgrade from Digi-Paint 1 for $29.95, or from other paint programs for $44.95.







(Top left) Attendees enjoy new public domain Star Trek game.

(Top right) Spirit Technology showed their expansion products for the Amiga.

(Bottom) Micro Momentum displayed their prototype portable Amiga.

Toast in the summer?

NewTek also demonstrated the latest version of the Toaster, now promised for summer release. The Toaster will reportedly carry a $1599 price tag. Allen Hastings of Rush Hour fame showed a videotape of work he's been doing with his new "fast non-ray-tracing renderer with lots of advanced texture options and special effects." He would not commit to a release date on the new program. However, others said the

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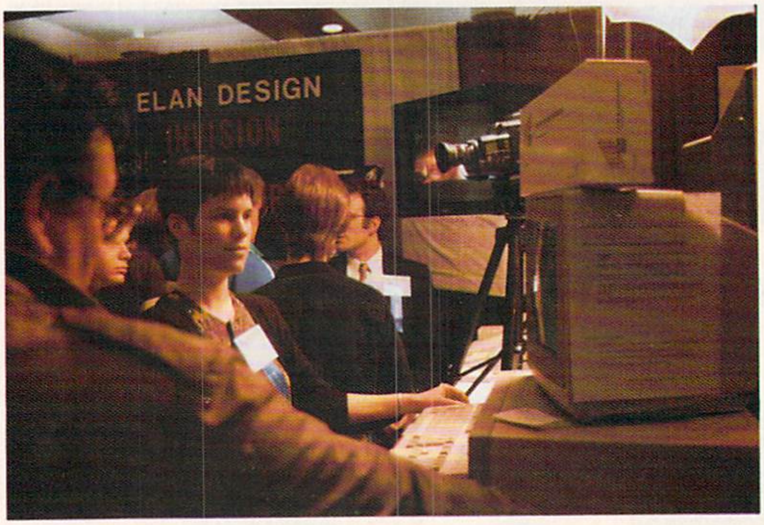

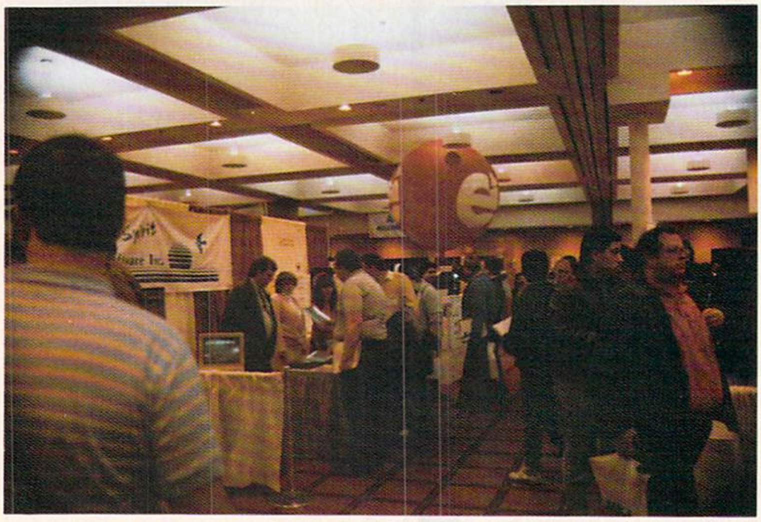

(Top) A-Squared's Wendy Peterson demonstrates Live 2000.

(Center) Visionary Design Technologies featured many hot new games.

(Bottom) Over three days, more than 11,800 poured into the second AmiEXPO NY.

program was at the same stage Videoscape was at when Allen turned it over to Aegis to finish off. Look for it from NewTek in the fall.

Byte by Byte announced a stripped-down, non-ray-tracing version of Sculpt 4D called Sculpt/Animate Jr. Priced around $150 and geared to the A500 market, the program will use and produce files compatible with its parent. The company also released a "3D Cookbook" videotape, a visual introduction and tutorial with "powerful, time-saving recipes for creating complex objects and animations."

Over at **Impulse's** booth, Stan Kalisher demonstrated Turbo Silver SV, a version of the ray-tracer that produces images viewable with 3D glasses (You can use either Haitex or Sega glasses plugged into a new Impulse-built interface box).

Impulse's VD-1 frame buffer/grabber was also on display. This device takes any signal from broadcast, camera, or VCR and instantly grabs the image in 24 bitplanes, then sends it to the Amiga to be turned into Ham, or 32 colors in full overscan and interlace if required. Units are shipping slowly at $1000.

Genlocks

There were several genlocks at the show. Communication Specialties showed their Gen/One unit with S-VHS-compatible output signals and clean video pass-through. VidTech's Scanlock is the first to allow both input and output of S-VHS. Magni was represented at the Amicore booth, where the Canon still video system was incorporated into a full-fledged post-production video environment.

R & DL Productions announced the release of Lightbox, a new professional animation tool which allows you to animate cartoons with the control of a conventional light box and peg system plus the advantages of a computer paint program. Lightbox displays drawings which appear before and after the drawing currently being worked on.

All in-betweens are hand-drawn for full control of expression of character and illusion of life. The drawings can be worked on at any time, and stepped through frame by frame or viewed at true speed by pressing the "flip" key. Several products that allow this technique have been announced, but Lightbox is here today, and works well with R & DL's AProDraw Graphics Tablet.

Maurice St. Sauveur was showing his SMPTE Exorciser Frame-by-Frame controller system at the **Alchemedia** booth. The SMPTE can perform continuous single-frame stores of up to 1000 pictures per edit list, and comes with a proprietary software-based time-code generator allowing you to use the Amiga for both audio and video striping. The wide-band, bi-directional hardware reader controller reads time code and interfaces the Amiga with VCR editing decks including the JVC 8000 series 3/4 inch, JVC 810 S-VHS, Panasonic 7500-A S-VHS, and all one-inch machines. The system will begin shipping in May and will cost significantly less than currently available alternatives.

Elan Design has a new presentation manager program called The Performer, which puts the power to display graphics and animations of different formats literally at your fingertips. You can load and view files from all major paint, 2D, and 3D packages, sequence for programmed playback, or access any imagery directly by pressing its key. The program supports ANIM, RIFF, HAM, and RGB formats, and is programmed in 100% assembly language to facilitate multi-tasking and memory-management. The output can be sent in real time to videotape, or you can separate and recombine animations into different orders, resolutions, and animation formats.

Progressive Peripherals & Software showed FrameGrabber 256, a real-time, 8-bit video digitizer that captures interlaced, 256-shade monochromic images in 1/30th of a second. The product includes extensive acquisition/display software by Justin McCormick of PIXmate fame, and has a Delta mode for real-time image comparisons. PP&S also previewed the EXP-8000+ 8 megabyte internal expansion board for the A500, which also provides the option of adding a 68010 processor and user-adjustable 12.5 or 24 MHz math coprocessor. The Vault, an external hard drive for the 500 and 1000, comes in configurations ranging from 20 to 120 megs, the 20 meg version with controller, software and cables retailing for $599.95. The long-awaited Baud Bandit terminal software is ready for May 1 release. It features extensive macro functions and ARexx support.

Speaking of communications packages, **Micro-Systems Software** shipped The Works Platinum Edition Amiga starter kit with 5 integrated programs for telecommunications, word processing, spreadsheet, database, and printing utilities. MSS will break out versions of Online Platinum and Scribble Platinum at $99.95 and $149.95 respectively. The Works retails for $295. Not a bad deal, eh? Online now supports WX, X, Y, Zmodem, Kermit CompuServe B and SADIE (simultaneous file transfer/chat) protocols. All the programs are Clipboard-compatible.

WordPerfect held classes in their Theatre, complete with cheering students and free M&Ms. They informally announced PlanPerfect for the Amiga. PlanPerfect is based on the IBM version but it is now entering beta with a completely redone Amiga-tized interface. WordPerfect's next upgrade will be 6.0, not 5.0, and is promised to have an ARexx implementation.

Brown / Wagh showed a near-final version of Pen Pal, a clever word processor designed especially for smaller projects in the expanding home-office environment. It can mix text and graphics, import, mailmerge, copy from a built-in database, spellcheck, analyze writing styles, sort by fields, and more. This puppy appears irresistible. It's fast, sophisticated, and doesn't try to reach beyond its niche, which is basically anybody with $149.95 in April.

New Horizons announced a pair of font packages—ProFonts 1 with 10 professional fonts for printing, and ProFonts 2 with over 40 decorative fonts for headlines, packaging, covers, etc. Font packages were also available from **Free Spirit's** Media Line, which is expanding to include clip art and animation background disks. **Arock** is repackaging its Masterpiece Fonts and Clip Art sets into more manageable 3-disk packs, with six volumes in all.

C Ltd. had their Jet Master font editor on display. Jet Master will interchangeably load and/or save fonts in either Amiga screen format or HP LaserJet format. It can do automatic global special effects, like drop shadows. Jet Master retails for $79.95. Also now available from C Ltd. is their PrintScript Postscript emulator for the Amiga, a full Postscript interpreter that runs in memory, takes a Postscript file, and prints it on any printer Preferences supports. At $89.95, PrintScript has LaserExpress virtual page support.

Making its debut at last was **Soft-Logik's** PageStream desktop publishing software, the self-proclaimed PageSetter killer and ProPage rival. The program fully supports dot-matrix printers, rotates text and graphics in any direction in 1-degree increments, allows independent x and y point sizes under mouse or type-in control, and has the built-in ability to work with 24-bit color pictures and color postscript directly. The current version does have some bugs, but Soft-Logik promises an update with

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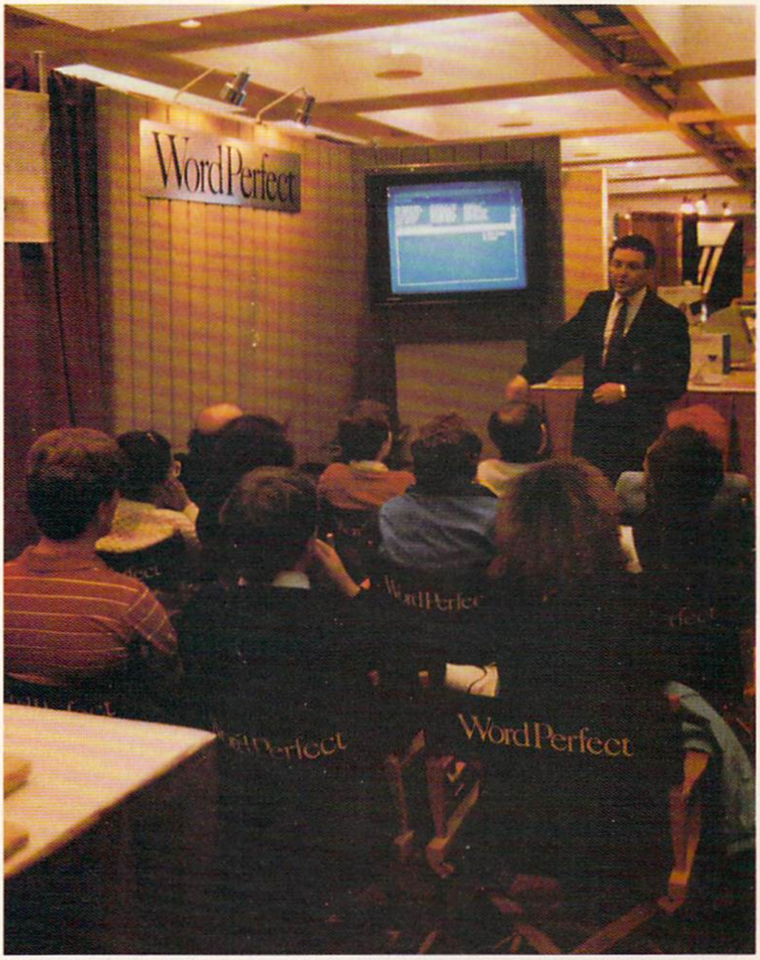

WordPerfect *held classes in their Theatre, complete with cheering students and free M&Ms.*

more printer support and additional fonts by the middle of April. In the interim, users are advised to save often and call the Soft-Logik BBS to download PD fonts available there.

Syndesis announced two new modules for Interchange—Turbo Silver 3.0 and Professional Draw. Now all InterFont text and structured objects can be used with ProDraw, and text can now have up to 16 colors as opposed to PDraw's current 2. A 3D wireframe viewing module is in development. Syndesis will also release their TSSnet DECnet networking software in the second quarter of '89, letting Amigas become Phase IV end nodes in a DECnet network that can consist of over 64,000 different computers running a wide variety of operating systems. The release will fully support and be bundled with Dale Luck's X-Window system.

Gold Disk was not officially represented at AmiEXPO. However, they did maintain a suite at the Marriott to brief the press and meet with beta-testers and various Amiga luminaries. We were given a preview of several new products in their Home Office Series, including Design 3D, a fast modeling package with a built-in font editor ($99.95); Transcript, a fast word processor compatible with Professional Page ($69.95); and Advantage, a spreadsheet that apparently can handle unlimited rows and columns and has elaborate charting graphics capability and ARexx support. ($79.95 when released in early summer). Gold Disk is also supporting their release of Professional Draw with a package of Structured Clip Art ($59.95) and ProPage with their Template and Design Guide ($59.95).

Gold Disk did take part in a press conference held on the floor of the show by **ASDG**, where the two vendors announced support for 24-bit scanned images in the forthcoming Professional Page 1.2 by using ASDG-RESEP. ASDG was also bringing their Dual Serial Board to market at $299. The board occupies a single expansion slot on the A2000 motherboard and does not prevent function of the original built-in serial port.

Creative Microsystems, Inc. also showed a multifunction board with one parallel port and two serial ports (one being a high-speed AppleTalk-compatible port). The hardware comes bundled with standard serial device drivers and low-level networking software. CMI also showed the new line of Processor Accelerator + boards for all three Amigas. The 1000 version has a kickstart ROM socket and a real-time clock compatible with the Commodore A501 clock. The A2000 version goes in the coprocessor slot and has the capability to run RAM at 10.5 or 14 megahertz.

Memory And Storage Technologies (M.A.S..T.) continues to break the size barrier with their line of hard drives and memory boards. Their Tiny Tiger drives are the only drives that will support all three Amiga models by giving you a SCSI controller through the parallel port. You can also daisy chain off this unit. M.A.S.T. also showed the prototype for the first one-third height drive, enabling the user to get three hard drives into a one-drive IBM-style expansion box.

Great Valley Products had a huge booth with new products to match. Their 68030 coprocessor accelerator board for the A2000 was being shown in its 25MHz version. It has an asynchronous bus design and, because of the use of special nibble-mode DRAM SIMMS, an effective zero wait-state. The board comes with 32-bit RAM in 4 and 8MB configurations. GVP's Syquest removable hard drive with its 44 megabyte cartridge automatically recognizes disk changes with GVP's new EPROM auto-boot software kit. A demonstration of their Wangtek 150 meg streaming tape backup system used a port to the Amiga of the UNIX tar utility and standard 3M cartridges.

Gramma Software, hot on the heels of their Nag Plus Schedule Assistant, announced FreD, the speed-dialer program, and NoMo, a hardware device that goes between the audio output of the Amiga and your telephone. Used together and/or with a modem, they let you use your Amiga to deliver messages to a phone list of people automatically, and they let you use the internal sound chips to send audio over the phone. With the hardware around $25 and FreD near $50 when released in June, the total cost of this Arexx-driven system is less than almost any modem.

Indeed the Arexx environment took great strides in the months since AmiEXPO LA. Programs shown at New York with Arexx ports included Nag Plus, FreD, ASDG's CygnusEd Professional, and PageRender 3D, a new ray-tracing package from **Mindware**. Also coming with Arexx in June is 3D Professional from Cryogenic Software, to be marketed by Progressive Peripherals. Seen talking Arexx on the floor were Dan Browning of **Precision** (SuperBase Pro and SuperPlan) and Gary Samad of **Software Visions** (Microfiche Filer Plus). Samad announced the imminent release of the first two Designer Database disks, with Arexx-driven databases for Home and Business. And **Emerald Intelligence** took time out from showing their (gasp) Mac version of Magellan to promise their Revision 1.1 with Arexx will be shipping soon. They were also hinting at a port of a program coming the other way around from the Macintosh environment. Wonder what "card" they have up their sleeve?

Music, Music, Music

Another program originally on the Mac and now available on the Amiga is **Intelligent Computer Music System's** M, the interactive composing and performing MIDI software. **Dr. T's** showed their Level II sequencer, which adds the Programmable Variations Generator and the Master Editor to KCS V1.6A. **New Wave Software** released Dynamic Studio 3.0, with a redesigned WYSIWYG user interface, increased resolution, auto-quantizing, and the ability to make either global or specific changes with mouse control. **Impulse** will release a hardware/software package called Harmony which will allow you to input vocals and humming or whistling and output MIDI events.

And last but not least, Mindware is readying an add-on to PageFlipper Plus called PageSync. It will let you synchronize MIDI events and sound effects in real time or under script control.

The story of AmiEXPO NY '89 was one of growth, consolidation, and interconnectivity. As much went on in the hallways and suites of the Marriot Marquis as did on the floor and in the well-attended seminars and master classes. **Commodore** was represented unofficially by Gail Wellington, Lauren Brown, Carolyn Scheppner, Andy Finkel, Steve Beats, Dave Haynie, Dave Berezowski, Bill Koester, Bryce Nesbitt, and CBMers from Sweden, Spain, Switzerland, and Germany. Seen here and there were John Toebes at the **Lattice** booth, Jim Goodnow promising Manx 5.0 this summer, **VirusX's** Steve Tibbett, **PeopleLink's** Jim Hill, author Rob Peck at the CLI clinic, and Amiga artists Marvin

(continued)

Send us your best...

The pages of Amazing Computing™ are filled with the efforts of Amiga enthusiasts just like you. Each article in AC is the written record of a fellow Amiga user who has learned a little more about this amazing computer. The exception is, the fellow who wrote the article was paid for his efforts.

Amazing Computing was created for the Amiga community to share and expand the knowledge of the Amiga. From Hardware "how to articles" to Software reviews, each Amazing Author has taken our knowledge a little farther. Each article has given us a little more insight into how our Amigas can make us more creative and more productive.

If you have discovered a new use for your Amiga or you have created a great program, let us know. Not only are your ideas important, they are necessary. Amiga users enjoy reading about other users creating a better life with their Amigas.

AC is continually searching for all articles on the Amiga. We are searching for technical articles and everyday solutions. We enjoy game reviews and your insights into the latest compilers. In short, if it is Amiga related or of interest to the Amiga community, we want to publish it.

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There are no ideas too small or too large to be shared and you will never know how great it feels to share your ideas, until you have been published.

Landis, Steve Segal, Jim Sachs, and Louis Markoya, the latter showing some incredible 3D images at the **Haitex** booth.

There were some new faces, too. Teller of Penn and Teller visited the NewTek booth, along with Dana Carvey, Saturday Night Live cast member and brother of NewTek engineer Brad Carvey. Teller, as usual, wasn't talking, but Steve Young, senior correspondent for **CNN Business News**, was.

After a private preview of Gold Disk's parade of budget business software and a whirlwind Sculpt 4D-tour, Young paused to catch his breath. "I saw in the graphics area remarkable applications not equalled at anything like the price point." He shook his head in bemused wonder: "The cost of hardware and software is quantitatively less, yet with such a small user base. I am puzzled as to how the Amiga developers are able to produce at such a low price, or conversely how IBM and Apple are not."

Good question, Steve, and one that will be answered more and more as the Amiga gets serious. Meanwhile, like the song says, "It's up to you... Start spreading the news..."

This story is based on the reporting of Larry White, Tina Chase, Steve Gillmor and Don Hicks.

•AC•

AmiEXPO Exhibitor List

Alchemedia
163 8th Ave, 2nd Floor
New York, NY 10011
(212) 727-9116

A.M.I.G.A
100 Brown Ave
Johnston, RI 02919
(401) 949-5310

Amazing Computing
P. O. Box 869
Fall River, MA 02720
(508) 678-4200

AmiCore International
154 Grove Street
Chicopee, MA 01020
(413) 592-9122

Amiga Sentry
706 Old Marple Road
Springfield, PA 19064
(215) 544-6394

AmigaWorld
80 Elm Street
Peterborough, NH 03458
(603) 924-9471

AmigoTimes
5124 St. Laurent, Ste. 100
Ville St. Catherine, QU J0L 1E0
Canada
(514) 638-6303

AMnews Corporation
542 Hannover
Livermore, CA 94550
(415) 443-3956

AMuse, New York Amiga Users
151 1st Avenue, Suite 182
New York, NY 10003
(212) 460-8067

Antic Publishing, Inc.
544 Second Street
San Francisco, CA 94107
(415) 957-0886

AROCK Computer Software
1306 East Sunshine
Springfield, MO 65804
(417) 887-3021

ASDG Inc.
925 Stewart Street
Madison, WI 53713
(608) 273-6585

Brown-Wagh Publishing, Inc.
16975 Lark Avenue, Suite 210
Los Gatos, CA 95030
(408) 395-3838

Byte by Byte
9442 Capitol of Texas Highway
Austin, TX 78759
(512) 343-4357

C Ltd.
723 East Skinner
Wichita, KS 67211
(316) 267-3807

Digital Depot
1500 48th Street
North Bergen, NJ 07047
(201) 864-4858

Communications Specialties, Inc.
89A Cabot Court
Hauppauge, NY 11788
(516) 273-0404

COMPUTE!
324 W. Wendover Ave, Suite 200
Greensboro, NC 27408
(919) 275-9809

Connecting Point
2565 Route 22 West
Union, NJ 07083
(201) 686-0040

Creative Computers
4453 Redondo Beach Boulevard
Lawndale, CA 90260
(800) 872-8882

Creative Microsystems, Inc.
10110 S. W. Nimbus, Suite B1
Portland, OR 97223
(503) 691-2552

Croftword Publishing, Inc.
85 West Wilmot Street, Unit 10
Richmond Hill, ON L4B 1K7 Canada
(416) 764-5274

Dr. T's Music Software, Inc.
220 Boylston Street, #206
Chestnut Hill, MA 02167
(617) 244-6954

Elan Design, Inc.
P. O. Box 31725
San Francisco, CA 94131
(415) 621-8673

Emerald Intelligence
3915-A1 Research Park Drive
Ann Arbor, MI 48108
(313) 663-8757

Free Spirit Software, Inc.
58 Noble Street
Kutztown, PA 19530
(215) 683-5609

Fuller Computer Systems
P. O. Box 9222
Mesa, AZ 85214
(602) 835-5018

Gramma Software
17730 15th Ave, N.E., Suite 223
Seattle, WA 98155
(206) 363-6417

Great Valley Products
225 Plank Road
Paoli, PA 19301
(215) 889-9411

Haitex Resources
208 Carrollton Park, Suite 1207
Carrollton, TX 75006
(214) 241-8030

Hillside Hard & Soft Computerware
RD 3, Box 3420A
Fleetwood, PA 19522
(215) 929-9695

Impulse
6870 Shingle Creek Parkway, Suite 112
Minneapolis, MN 55430
(612) 566-0221

Incognito Software
34518 Warren, Suite 149
Westland, MI 48185
(313) 462-2148

Intelligent Music
116 North Lake Ave.
Albany, NY 12206
(518) 434-4110

Interactive Video Systems
15201 Santa Gertrudes #Y102
La Miranda, CA 90638
(714) 994-4443

Intercare Development Systems
24 Bruce Drive
South Setauket, NY 11720
(516) 981-5930

Lattice, Inc.
2500 S. Highland Ave, Suite 300
Lombard, IL 60148
(312) 916-1600

Leigh's Computers
1475 3rd Ave
New York, NY 10028
(212) 879-6257

Long Island Commodore
Amigians
91-19 85 Avenue
Woodhaven, NY 11421
(718) 849-8591

Memory and Storage
Technologies
3881 Benatar Way, Suite E
Chico, CA 95928
(916) 342-6278

Manx Software
P. O. Box 55
Shrewsbury, NJ 07702
(201) 542-2750

MCP Associates, Inc.
28-21 Astoria Blvd.
Astoria, NY 11102-1933
(718) 956-9000

Micro Momentum
100 Brown Ave
Johnston, RI 02919
(401) 949-5310

Micro-Systems Software
12798 Forest Hill Blvd., Suite 202
West Palm Beach, FL 33414
(407) 790-0770

Microdeal/Michtron
576 S. Telegraph
Pontiac, MI 48053
(313) 374-5700

Mindware International
230 Bayview Drive, Suite 1
Barrie, ON L4N 4Y8 Canada
(705) 737-5998

Mission Graphics Support, Inc.
433 E. 6th Street
New York, NY 10009
(212) 473-2443

New Horizons Software, Inc.
P. O. Box 43167
Austin, TX 78745
(512) 328-6650

New Wave Software
22615 Carolina
St. Clair Shores, MI 48080
(313) 771-4465

NewTek
115 W. Crane Street
Topeka, KS 66603
(800) 843-8934

Progressive Peripherals and
Software
464 Kalamath Street
Denver, CO 80204
(303) 825-4144

Psygnosis, Ltd.
2150 Executive Drive
Addison, IL 60101
(312) 620-4444

R & DL Productions
11-24 46th Avenue 2A
Long Island City, NY 11101
(718) 392-4090

Ronin Research and
Development, Inc.
P. O. Box 1093
Alameda, CA 94501
(415) 769-9325

Soft-Logik Publishing
Corporation
11131 F South Towne Square
St. Louis, MO 63123
(314) 894-8608

Software Excitement
8 North Fourth Street
Central Point, OR 97502
(503) 664-1364

Spirit Technology Corp.
220 W. 2950 South
Salt Lake City, UT 84115
(801) 485-4233

Syndesis
20 West Street
Wilmington, MA 01887
(508) 657-5585

Vidtech International, Inc.
2822 N. W. 79th Ave
Miami, FL 33122
(305) 477-2228

Visionary Design
Technologies, Inc.
45 Whitehorn Crescent
Willowdale, ON M2J 3B1
Canada
(416) 497-0933

WordPerfect Corporation
1555 North Technology Way
Orem, UT 84057
(801) 222-5877

Yet Another Amiga Magazine
3712 Fort Worth Ave
Alexandria, VA
(703) 536-5040

AmiEXPO

Art and Video Contest Winners

by Steve Jacobs

AmiEXPO has always had an Art and Video Theatre where convention attendees could view slide shows and animations produced by fellow Amigans across the country. After our third convention, we decided to establish an art contest in conjunction with the NewYork show this past month. The contest was announced in the fourth quarter of 1988 and the rules and guidelines were distributed at the Los Angeles AmiEXPO and at AmiFORUM. The Amiga press was kind enough to carry our press releases, and hundreds of requests for entry forms came into the office.

Frequently, contests have categories arranged around themes or types of art, for example, "Fine Art", "Commercial Art", or "Cartoon". However, I had no idea what range our entries would cover. Therefore, I arranged the categories in a slightly different manner.

The contest was organized over five categories. The Art categories were "2D" (for art created with the wide variety of Amiga "paint" programs), "3D" (for art created using the wide variety of three-dimensional rendering and ray-tracing packages on the Amiga), and "Digitized" (for works using digitization as part or all of the creative process). The "Video" categories were "Mixed Media" (for works combining computer-generated video with live or pre-recorded video), and "Animation" (for purely computer-generated pieces).

I was pleased to find we received a wide variety of material. (I was deeply fearful of the possibility of receiving 200 science fiction illustrations). We had abstracts, commercial pieces, cartoons, photo-realistic pieces, and pieces with a "water-color" feel to them. (The judges remarked that several entries had an "oil-on-velvet" feel to them as well. This was not a compliment.)

Most Amiga animation contests have been built around disk-based animations. I required all animation submissions be on videotape. There were two reasons for this. First, disk-based animations are limited to a certain size and length. Though new programs like MovieSetter and the soon to be released Blacklight are stretching these lengths to minutes, the limits remain. The second consideration was disk load time. In terms of judging, the more complex animations take longer to load than play. When you have a group of people watching monitor screens for hours on end, loading time becomes a big factor in sustaining audience attention.

> *"Overall, over two hundred Amiga enthusiasts entered the contest. Over 350 images were submitted in the art categories, and over 35 works were entered in the Animation and Mixed-Media categories, for a total of two hours viewing time."*

Goals for the Contest

I had several different goals for the contest. First, I saw the contest as a way of getting more publicity for the artists. I required the artists give me the rights to distribute their work to the magazines. The artists retained their copyrights, though. They were not asked to either put their work in the public domain or surrender them to AmiEXPO. I believe it's important for people to retain the rights to their own work.

(continued)

I also tried to sign on judges from outside the Amiga community and/or judges well-known in their own right. I thought this would improve the chances of getting magazines outside the Amiga community interested in covering the Amiga. I was able to get several "heavy hitters" as judges. This was another reason for refusing disk-based animations. You cannot impress judges used to high-end equipment with thirty-second animation loops that take five minutes to load.

Entries and Systems

The entries came from across the broad spectrum of the Amiga community. People of all ages from the continental U.S., Hawaii and Canada entered the contest. A third of the contest entries came from women. At a time when the New York Times is running articles about the lack of female involvement with computers nationwide, this a very exciting bit of news.

Our artists included both professional artists and novices. Stand-out entries included a series of pictures from a Long Island high school Amiga art lab, and a nun who runs an Amiga users group in her Upper West Side church.

Overall, over two hundred Amiga enthusiasts entered the contest. Over 350 images were submitted in the art categories, and over 35 works were entered in the Animation and Mixed-Media categories, for a total of two hours viewing time. Winning entries, as well as, a selection of other submissions, were shown in the AmiEXPO Theatre during the three days of the show.

If our entrants qualify as a representative sample of Amiga owners, there's still a large number of active 1000's out there (including the one sitting on my desk). Most entrants had some type of upgraded memory for their systems. Over 90% drew their creations with a mouse.

There are two items almost every Amigan owns. The first is Deluxe Paint II. The second is Digi-View. Almost as popular with our entrants were Photon Paint and Pixmate. In the 3D category, Sculpt 3D and Animate 3D were used a little more often than Turbo Silver. In the Animation Categories, there were no packages that stood out as most frequently used. Several entrants actually wrote their own software as part of their entries.

The Judging and the Judge

The judging was held on February 19th at Mission Graphics Support, Inc. in Manhattan. We did attract some high caliber judges. Our first judge, Diane Kadah, is President of the New York Chapter of the National Computer Graphics Association. She is also a presentation graphics consultant. Our second judge, Issac Victor Kerlow, is Director of the Computer Graphics Lab at Pratt Institute in New York City. He is also an author of computer graphics texts and a well-known artist in computer graphics circles. Perry Hoberman, the third judge, is known for his stereoscopic computer art and performance art. Acting as fourth judge, Vincent Billota is Director of Graphics and Animation for Mission Graphics Support, Inc., a Lower East Side Amiga dealership specializing in high-end video workstations. Vincent has been instrumental in developing the New York Amiga animation scene. I was the fifth judge.

From 1:00 p.m. to 6:30 p.m., we stared at monitors until our eyes were a bright pink. The still images filled almost 20 megabytes of the GVP Impact 500 used to display them. We alternated video and still categories for a change of pace. The judges chose a 1st, 2nd and 3rd place winner for each category, with several pieces being selected for "honorable mention". With most of the categories, the judges were able to come to a consensus without having to "grade" or number the entries.

The winners were announced and shown after Gail Wellington's keynote speech Friday afternoon. First prize winners received computer hardware and software specific to the category. In addition, first, second and third place winners in each category were awarded plaques honoring their achievements.

The winning entries stress the versatility of the Amiga. The winning 3D entry required an Amiga 2000 with tons of RAM and an accelerator. The winning 2D entry was produced on an Amiga 500 upgraded to one meg of RAM and DPaint II.

Tips On Entering Next Year's Contest!

I'd like to take a moment to give you a few pieces of advise to help you in submitting your artwork. These apply not only to the AmiEXPO Theatre and next year's contest, but to other contests and exhibitions as well.

First and foremost, READ THE RULES!!! Most professional contests will simply refuse to even look at your work, let alone judge it, if you haven't followed all contest rules EXACTLY. Several disks and tapes we received could not be used because they did not meet the categories as outlined in the rules. The winning animation entry was incorrectly submitted as a mixed-media entry. If you're not sure which category to submit your work to, call the organizer and ask. DON'T send multiple disks of the same work to each category.

Fill out the entry form completely. THINK about the questions and, if you're not sure how to answer them, call the organizer and ask. On the entry form for the AmiEXPO contest, I asked entrants to describe "the hardware and software" used to make the piece. Twenty-five entrants neglected to tell us which Amiga they used and simply listed their software.

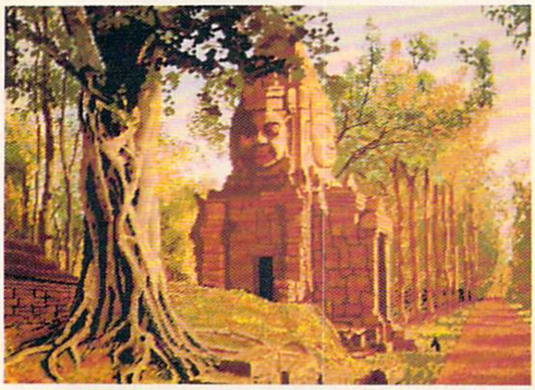
Also, try to use standard formats and screen sizes for your work. Several people submitted pages larger than the screen or pieces made in beta tests of software not yet released. Due to time limitations, exceptions could not be made to show to judges work that could not be displayed in a slide show program. If your work needs special attention in order to be displayed, (e.g., multiple monitors, scrolling around the screen, 3D glasses) call the contest organizer before submitting your work.

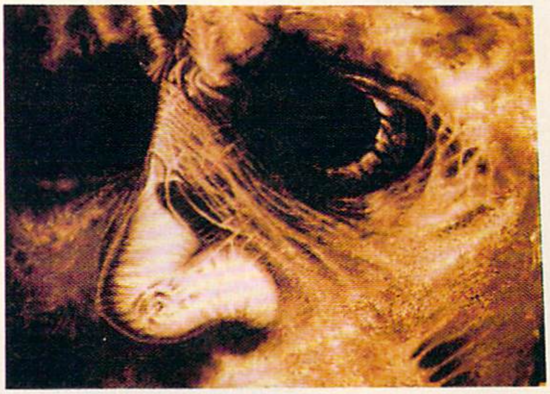
If there are several different categories of disk-based work, submit the pieces for each category (no matter how many or few) on a separate disk. If your pieces are going to be loaded onto a hard drive for exhibition, this makes it easier for the contest organizer to load the work into the individual directories. Label the disk with your name and phone number, the names of the pictures on the disk, and the category you are submitting them to.

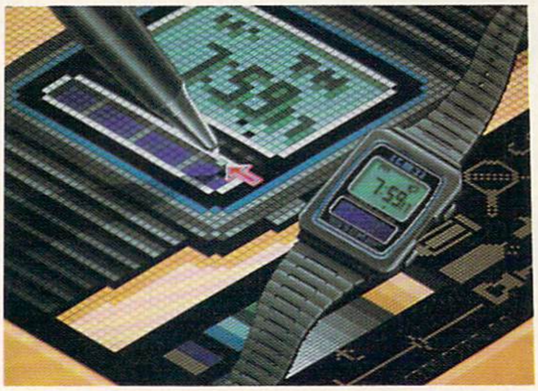
(continued on page 57)

2D Category

***Prize**: A ProDraw Package from R & DL Productions*







***First Place** (above left)*
***"Burmese Penguin Hunt"** by Jim Schanz*
Amiga 500, 1 Megabyte of RAM, Deluxe Paint II, Mouse

***Second Place** (right)*
"Screen"
by DeWayne Stauffer
Amiga 1000, 2 1/2 Megs of RAM, Deluxe Paint II

***Third Place** (above right)*
"Necropsy"
by Dave Cockerill
Amiga 1000, 512K RAM, Deluxe Paint II

Honorable Mention
(not shown)
"Shadow Cat"
by Dirk Alan Jones
Amiga 2000, 3 Megs RAM, GVP Hard Card 60meg HD, Deluxe Paint II, Sculpt3D, Deluxe PhotoLab

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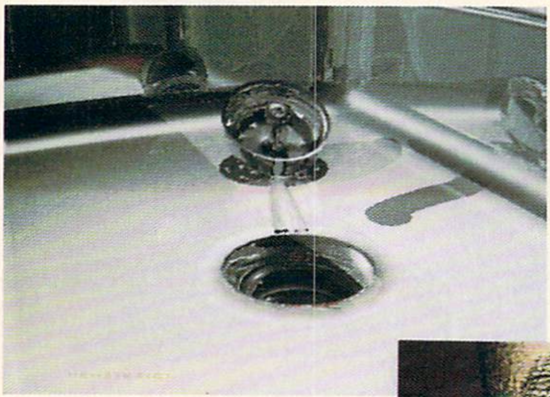
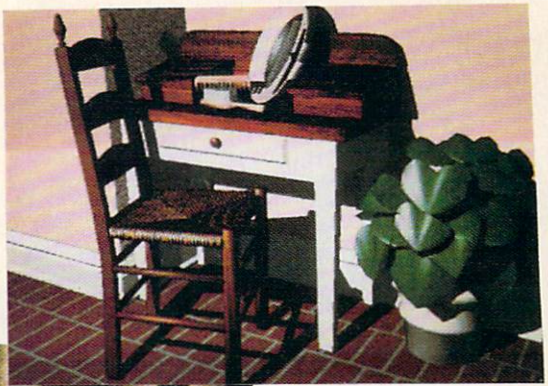
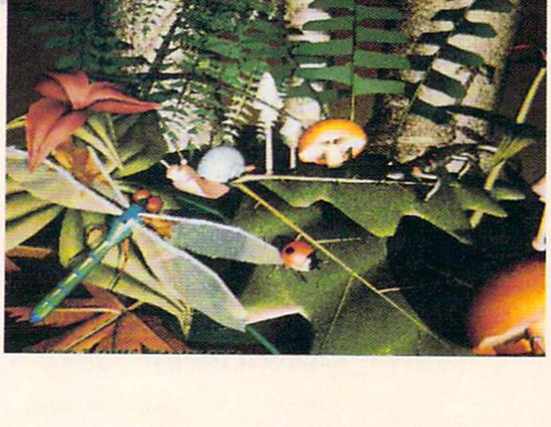
3D Category

Prize:
"Midget Racer" Accelerator from CSA







***First Place** (right)*
"Woodland2"
by Louis Markoya
Amiga 2000, 6 Megs of RAM, Hurricane Card, Turbo Silver

***Second Place** (above left)*
"Drain"
by Stephen Menzies
Amiga 2000, 3 Megs of RAM, Turbo Silver, Diamond, Terrain Generator

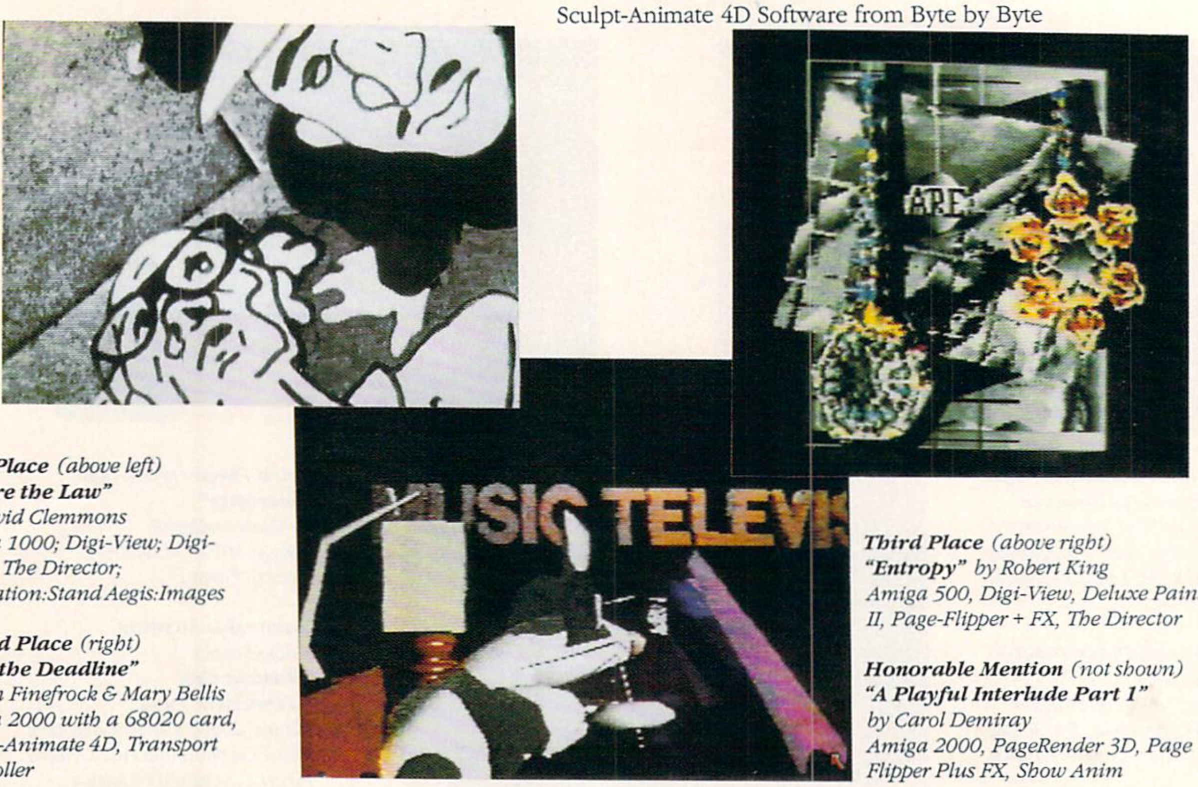
***Third Place** (above right)*
***"Vanity"** by Alan Henry*
Amiga 1000, 2 1/2 Megs RAM, Turbo Silver

***Honorable Mention** (not shown)*
***"Dunk"** by Alan Henry*
Amiga 1000, 2 1/2 Megs RAM, Turbo Silver

***Honorable Mention** (not shown)*
***"Pepper Rat"** by Mary Bellis*
Amiga 2000, Sculpt-Animate 4D, Photon Paint

Animation Category

***Prize**: 30 Megabyte Hard Drive from Supra Corporation, Sculpt-Animate 4D Software from Byte by Byte*

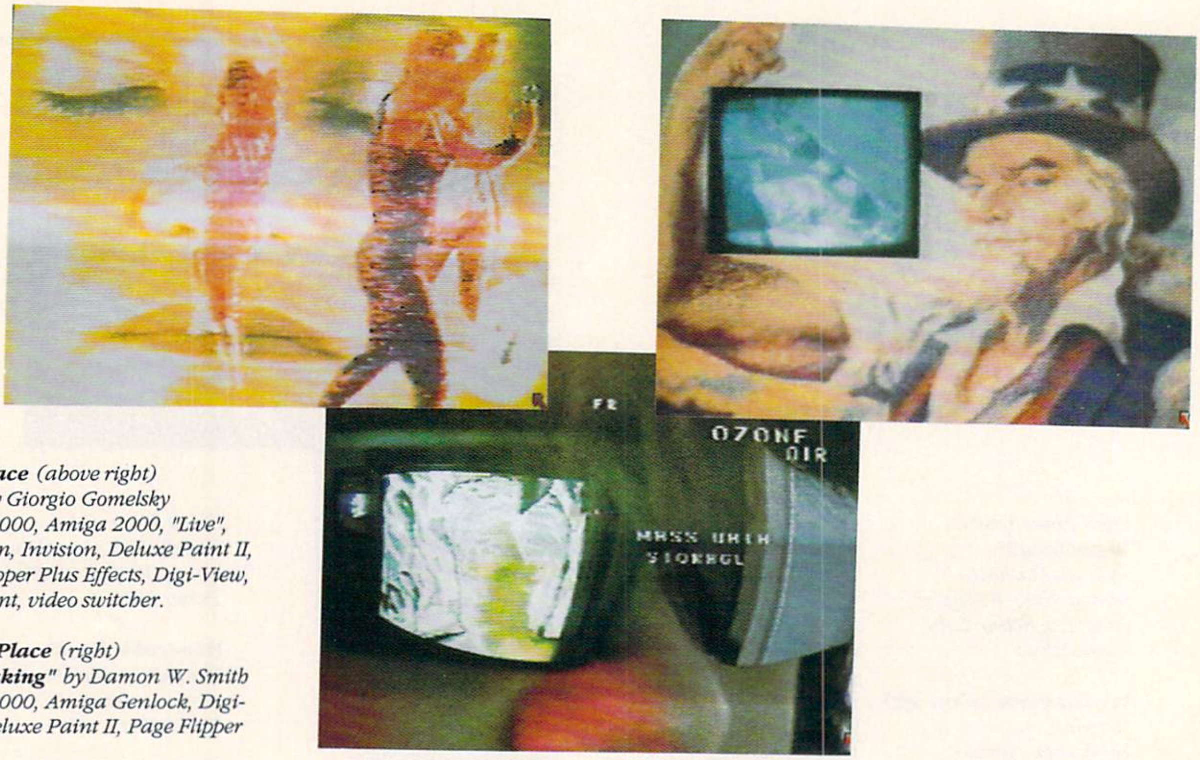


***First Place** (above left)*
"Before the Law"
by David Clemmons
Amiga 1000; Digi-View; Digi-Paint; The Director; Animation:Stand Aegis:Images

***Second Place** (right)*
"Past the Deadline"
by Tim Finefrock & Mary Bellis
Amiga 2000 with a 68020 card, Sculpt-Animate 4D, Transport Controller

***Third Place** (above right)*
***"Entropy"** by Robert King*
Amiga 500, Digi-View, Deluxe Paint II, Page-Flipper + FX, The Director

***Honorable Mention** (not shown)*
"A Playful Interlude Part 1"
by Carol Demiray
Amiga 2000, PageRender 3D, Page Flipper Plus FX, Show Anim



***First Place** (above right)*
***"CIA"** by Giorgio Gomelsky*
Amiga 1000, Amiga 2000, "Live", SuperGen, Invision, Deluxe Paint II, Page Flipper Plus Effects, Digi-View, Digi-Paint, video switcher.

***Second Place** (right)*
***"Trypticking"** by Damon W. Smith*
Amiga 1000, Amiga Genlock, Digi-View, Deluxe Paint II, Page Flipper

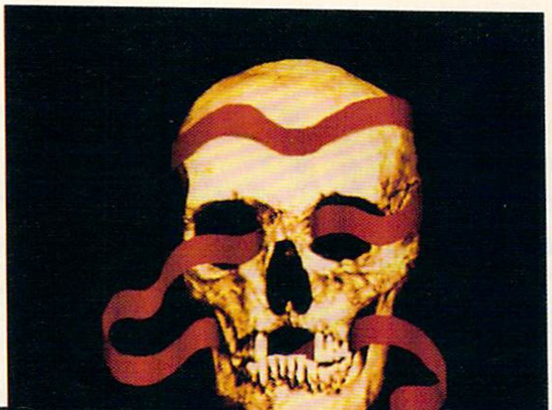
***Third Place** (above left)*
"Lake of Dreams"
by Gary Glassman
Amiga 1000, "Live", Deluxe Paint II, Super Gen, SupraDrive 20 Meg

Mixed Media Category

***Prize:** "Live" from A-Squared, Inc., "Invision" and "Performer" software from Elan Design*

Digitized Category

Prize:
"Perfect Vision" Digitizer from Sunrize



First Place *(right)*
"Self Portrait"
by Kai Ammen
Amiga 2000, 1 Meg, Digi-View, Deluxe Paint II, Pixmate.

Second Place *(above right)*
"Untitled"
by T. J. Shank
Amiga 1000, 1 Megabyte, Digi-View, Deluxe Paint II

Third Place *(above left)*
"Chameleon"
by J. Mark Greenelsh
Amiga 2000, Digi-View, Digi-Paint, Deluxe Paint II, Pixmate

Honorable Mention *(not shown)*
"Madonna and Child in front of an arch which forms the perceptible but Invisible Portrait of Rembrandt"
by Louis Markoya
Amiga 2000, 3 Megs of RAM, Hurricane Card, Digi-View, Digi-Paint

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Videotaped submissions should have a soundtrack!!! Even if it's a fully computer-generated visual, there should be some kind of sound or music added later on. It doesn't have to be created by the computer. Simply adding sound from records or tapes can greatly improve how your work is viewed by others. Animation is an audio-visual medium.

Submit your work on 3/4" tape if at all humanly possible. Yes, it's expensive. And yes, it may be hard to find (though most major cities have artists access centers for film and video, and most colleges have 3/4" equipment). The point is VHS video is lousy video in terms of its signal. Just because it looks OK at home doesn't mean all is right with the world.

The videotape you submit to a contest will most likely be dubbed (copied) into a loop of all the entries for viewing purposes. VHS does not copy well. If your video comes straight out of the computer onto VHS, and you send the original, the signal will be OK. Most people will send a copy of the original. That means the copy will then be copied again into the loop. This means you've already lost some picture quality. If you are editing pieces together (1st copy), then copying the edited version (2nd copy) to send to the contest (3rd copy), your piece may already be unviewable. If you've been using cheap tape, you are definitely wasting your energy.

The bottom line is, this is YOUR work. If you want it seen in the best possible light, you should spend the extra time and money and do it right.

There will be another AmiEXPO Art and Video Contest next year. As this article is being written two days after AmiEXPO New York closed, I cannot give you dates or categories at this time. Look for them soon in another issue. There will be another version of the AmiEXPO Theatre being shown at AmiEXPO Chicago, July 28-30th. If you'd like your work to be considered for exhibition, send me stills on disk and moving images on tape by July 1st.

•AC•

Interested artists should contact Steve Jacobs at AmiEXPO for more information:

AmiEXPO
attn: Steve Jacobs
211 E. 43rd Street., Suite 301
New York, NY 10017

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May 6th & 7th

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AmiFORUM - Texas, May 6th - 7th, 1989

AmiFORUM Master Classes The Amiga Education

Amiga Graphics and Artist's Techniques.
Renown Amiga Artist Jim Sachs (*Defender of the Crown, Ports of Call*) will teach beginners from 10:00 A.M.-1:00 P.M. on Saturday and advanced students from 2:00-5:00 P.M. on Saturday and 10:00 A.M.-1:00 P.M. and 2:00-5:00 P.M. Sunday. Mr. Sachs will hold a "critique" session after hours both days for students of his classes.

Amiga Animation
Steve (*Dance of the Stumblers*) Segal, award winning Amiga animator and educator will teach two-dimensional techniques for beginner animators from 10:00 A.M.-1:00 P.M. and three-dimensional techniques for advanced animators from 2:00-5:00 P.M. both Saturday and Sunday.

Amiga Video
Cal Vornberger, independent producer and art director, will teach an overview of video techniques and discuss broadcast video terminology for beginners from 10:00 A.M.-1:00 P.M. and advanced video users from 2:00-5:00 P.M. both Saturday and Sunday.

Programming the Amiga in "C"
This class in "C" programming on the Amiga concentrating on using the Exec in Programming I (10:00 A.M. - 1:00 P.M.) and on Graphics programming for advanced students in Programming II (2:00-5:00 P.M.) both Saturday and Sunday. Instructor to be announced.

THE EXHIBIT

Over 40 Amiga developers will display the latest and most advanced Amiga technology on the market today. Included will be software publishers, hardware manufactures, local area retailers, magazines and user groups.

Saturday May 6	Sunday May 7
10:00 A.M. to 6:00 P.M.	**12:00 Noon to 6:00 P.M.**

THE CLASSES

Master Classses are limited to 35 people per class. Admission is $50 per person. Please call **800-32-AMIGA** for class availability and to pre-register.

THE PLACE

AmiFORUM-Texas is being held at DFW Hilton Executive Conference Center, 1800 Highway 26E in Grapevine, Texas. Call 817-481-8444 for Hotel reservations.

THE COST

Admission to the Exhibition and the Exhibitor Demonstration area is as follows:

One Day	Two Days
One Day - $10.00	Two Days - $15.00

THE REGISTRATION

Master Class attendees may register in advance by calling AmiHeadquarters at **800-32-AMIGA**. You must have a valid MasterCard or Visa credit card to register on the phone. **Deadline for Master Class Pre-Registration is May 3, 1989. Exhibit Only attendees may register at the door only.** On-site registration is open from 8:00 a.m. to 4:00 p.m. both days.

THE AIRLINE

Call American Airlines at 800-433-1790 with ID 83536 for a special 5% discount on all flights to the Dallas-Fort Worth Airport for AmiFORUM-Texas.

SYNC TIPS

Resolution, resolution, wherefore art thou, my resolution?

by Oran J. Sands, III

If there is one topic of video and computing that is continually misunderstood, it's resolution. For some reason, resolution seems to be a moving target. No sooner do you come to understand it, the rules seem to change. Well, this month we're going to tackle the issue of how to measure resolution, and why. So sit back and fasten your seat belt. This could be a bumpy ride.

There seem to be a thousand different ways to measure resolution, and a hundred different units of measure. Linepairs, lines, pixels, and bandwidth, are just a few of the more commonly used units you'll find when shopping or comparing video and computer gear. Remember that all resolutions aren't created equal. Just because two pieces of equipment have the same number listed under the specification of "Resolution", they don't necessarily have the same actual resolution.

When we say "resolution", we mean picture sharpness: How "crisp" is the picture? How much detail does it have? It is absolutely necessary to have some way of comparing pictures and the equipment that produces them. Since every type of equipment has its own method of measurement for resolution specs, we'll tackle each piece one by one.

VideoMeasurement

We'll look at video resolutions first. The most common way to quote video resolution is to measure it vertically and horizontally. Although it is possible to measure the resolution of both the luminance (brightness) and chrominance components of the video signal, we most often deal with those figures pertaining to the luminance. These figures are always the higher of the two, and more accurately reflect the signal's ability to convey information.

NTSC video defines the picture area vertically by the number of scanlines, and horizontally by the time it takes to scan from left to right across the screen. Theoretically, these are the maximums our resolution specs can attain. But actually, that's not the case. NTSC standards demand using several scanlines for sync and other special information, but not for video. Because of this, the number of vertical scanlines reduces to only 482 scanlines for displaying video. The time allotted for a horizontal scanline to cross the screen is 63 microseconds but, again, due to color standards, the actual time available for displaying video is closer to 52 microseconds (often rounded off to 50 for calculation purposes). This is the "active video" time (see figure one). So you can see that, when measuring video resolution, it's necessary to know what you're actually measuring.

Now the actual measurement is fairly simple. All video equipment (in the US, Canada, and Japan) uses the same number of scanlines, top-to-bottom, so this figure usually isn't quoted. Horizontal resolution is our important spec, so let's talk about that first.

Horizontal Video Resolution

We measure video horizontal resolution in lines. This measurement refers only to the luminance component of the video signal. If we aim a camera at a chart composed of evenly spaced black and white lines stood on end, our horizontal scanline would cross these lines as illustrated (see figure two). If we could slowly push these lines closer together, the camera would eventually reach a point where it would no longer be able to clearly distinguish between each black and white line. The result would be a gray smear. This is our point of maximum resolution. If we count all the lines— both black and white—that the camera can see in one scan, we then have our measurement of resolution. The video scanline sweeps from left to right as it records or displays a picture. As it encounters light or dark subjects, it produces high voltage for the white areas and low voltage for the dark. The quicker the scanline encounters these light-dark alternations, the more difficult it is for the electronics to produce the electrical waveform that becomes our video signal. We soon reach a point where the electronics can no longer accurately reproduce the level of detail we need. This, again, is our point of maximum resolution. For each swing of voltage, from positive to negative, the waveform completes one cycle. The time it takes this cycle to occur can be used to calculate the frequency (number of cycles per second) of the video signal. If this is done for the waveform at maximum resolution, we then have a frequency rating with which we can use to quote resolution. A shorthand method of calculating this is to figure there is 1MHz of bandwidth for every 80 lines of resolution (per picture height, the standard measurement, remember?). This method results in a number in megahertz, and is known as the bandwidth. A VCR with 240 lines of

> *Just because two pieces of equipment have the same number listed under the specification of "Resolution", they don't necessarily have the same actual resolution.*
> ***All resolutions aren't created equal.***

(continued)

Table One
Luminance Resolution Chart

Format/Device	Horiz. Rez (lines/ picture ht.)	Bandwidth (MHz)
VHS	240	3.0
Beta	240	3.0
8mm	250	3.2
3/4	250	3.2
3/4 SP	330	4.2
1" Type C	330	4.2
8mm Hiband	400	5.0
S-VHS	400	5.0
ED-Beta	500	6.2
Amiga	540	7.0
35 nanosec. character gen.	1071	14.0
FCC Maximum	3304.2	
Standard monitor	2403.0	

resolution has a bandwidth of 3.0 MHz. It is often used in the broadcast industry to describe various pieces of equipment.

NOTE: There are many incorrect assumptions about how to measure video resolution. Supposedly, all we have to do is count how many lines are viewable in one pass of the scanline to get our resolution spec. But do we count the number of white lines, the number of black lines, or both? For video measurement, we count each white AND black line. In film, you count line pairs to measure resolution. This procedure has confused some. Each black and each white line counts for video.

Caveat Emptor

Now that we know what to count, it seems simple to get our measurement spec. However, it's not as simple as counting the number of lines resolvable within a horizontal scan. If the number of lines is 800, we could use that number as the resolution, measured in lines per picture width. Unfortunately, this isn't the way video resolution is usually quoted. Since the aspect ratio of screen height to screen width is 3:4, the industry measures the number of lines counted in 3/4 or 75% of the picture width. So our number of 800 now becomes 600. When measuring resolution like this, the measurement is in lines per picture height. Although this may seem odd, this is the way it's done.

Let's look at the vertical video resolution briefly. I alluded to vertical measurements as unnecessary when dealing with only NTSC systems since the number of scanlines is always the same. Yet sometimes, you'll see the vertical spec quoted as a number from 480 to 525. This is only because whoever did the counting didn't know when to quit (or start). All these numbers represent the same resolution, for the most part.

Sometimes, though, you'll see the number quoted as 350 lines. This is because 480 scanlines can't see 480 lines unless they happen to fall directly upon the scanlines. Realistically, they are just as likely to fall between them. The engineers have a way of determining what the average works out to. It's about 350 lines. So, if you see that number, you'll know where it came from and how it compares to the 480 figure you'll see more often.

Let's review what we've learned before moving on.

1. Video horizontal resolution is measured by counting the number of clearly reproduced lines (black and white) in the "active" video area of one scanline.

2. This number of lines is known as "lines per picture width".

3. Video horizontal resolution is most commonly quoted in "lines per picture" height, which is 75% of the number of lines per picture width.

4. The number of lines converts to a frequency rating called the bandwidth.

Computers

We all think we know how to measure computer resolution but, again, we all get bitten by a few misconceptions. We measure horizontal resolution by the maximum number of pixels displayed on one horizontal line. So far, that sounds much like the way we start measuring video. But that number describes only the number of pixels inside the Amiga's borders (or those on any other computer with a bordered screen display).

The border itself is "active" video area. We need to count the pixels in this area also to come up with a number comparable to the video measurement methods. Fortunately for us, the Amiga can address that border area, and we should count it as our display area. Although we may program the Amiga to display a picture with a width of 768 pixels, closer examination finds that width violates some NTSC standards for horizontal line width. To keep our screen width within standards, the maximum number is closer to 719 pixels.

Now we have a measurement comparable to the video measurement of "lines per picture width". Converting it to a number measured in "lines per picture height", the standard measurement would be done by multiplying it by 3/4. Or you could convert the video number to "lines per picture width" by multiplying by 4/3. Just keep in mind that the video resolution is always quoted in "lines per picture height", which is the smaller number of the two methods. OK, let's wrap it up again. Here is a conversion formula to equate computer and video resolutions.

Lines per picture height =
(.75) x Lines per picture width=
(.75) x Total number of pixels for a full screen (addressable or not).

or

(4/3) x Lines (per picture height)=
Lines (per picture width)=
Total number of pixels for a full screen.

Let's run some numbers by just for fun. If the Amiga's maximum resolution is 719 pixels, then multiplying that by .75 will give us 539.25 lines (per picture height). In video terms, that's not a bad resolution figure. Converting that to a bandwidth figure gives us 6.7MHz.

Adding resolutions

Now that we know how to compare them, let's look at how the resolutions of various pieces of a video system will affect our picture. For the following examples, we'll assume the figures represent comparable resolutions. If you have a camera whose spec is 600 lines and a VCR with a resolution of 240 lines, and you put the two together to record a picture, what is the resolution of the final image?

a. 600 lines
b. 240 lines
c. fewer than 200

If you answered b (as most do), you probably subscribe to the bucket theory of resolution addition. Stated simply, if you had 600 gallons of water and you poured the water into a 240 gallon bucket, you'd get only 240 gallons left (and a mess on the floor). Unfortunately, this isn't how it works. Although it's hard to find a real consensus among engineers on this subject, most do agree that resolutions add like electrical resistors in parallel. For you non-engineer types, the following formula sums it up.

$$1/\text{Total effective resolution}= 1/\text{res1}+1/\text{res2}+....+1/\text{resN}$$

To use our example we get:

$$1/\text{Total} = 1/600 + 1/240= .001666+ .004166=.0058326$$

Juggling the equation gives us Total = 1/.0058326 = 171.45 lines. You can see that things get worse much quicker than you'd expect. How can we combat this problem? By making sure our resolution is as high as possible for every piece of equipment we buy. It's this reason (among others) that broadcasters pay astronomical prices for their equipment. There's another reason also.

NTSC and the FCC

Broadcasters have to use the NTSC signal to get the TV picture to your television, and several compromises are made on the way. The NTSC signal is capable of carrying high resolutions, over 1000 lines or more. Studio cameras are easily available with resolutions exceeding 800 lines. But due to FCC standards, you can't broadcast a signal exceeding 330 lines (4.2 MHz). So the transmitter limits the resolution to 330 lines. With our formula for adding resolutions, we can see we need as much res as possible to assure our actual transmitted signal will approach the 330 lines we are allowed. After it receives the signal, another compromise is made within your television.

The transmitted signal converts back to the original NTSC signal the broadcaster started with, minus some resolution. Then the NTSC signal decodes into its luminance and chrominance components. Unfortunately, in order to easily (and cheaply) separate those components, the resolution is again reduced, this time to 200 lines (2.4MHz). So, if all things were ideal, we'd have a maximum viewable picture with 200 lines of resolution on our TV. Since things aren't ideal, we end up with fewer.

It's possible to get better resolution from your TV if you use a more difficult (and more expensive) system for separating the color and brightness components. This is called "combing" as it uses a "comb" filter to keep the components apart, but intact. Sets using this process can show as much resolution as they get. But remember, if it's broadcast, then that's still only 330 lines, as mandated by the FCC.

***NOTE**: The FCC limits the resolution to keep the broadcasters' transmitted signal from exceeding their allotted channel space. Adjacent channels would interfere with each other if the resolution was greater.*

Nanosecond Measurement

One other method of measuring resolution is to refer to the smallest piece of picture your computer or character generator or paintbox can create, the pixel, and then state the amount of time needed to display it. This figure would be very small, measured in nanoseconds(ns). One nanosecond is one thousandth of a millionth of a second. You often see this figure when comparing resolutions of character generators or broadcast-quality computer graphics systems. The most common figure is 35 ns. Since 1428 pixels of 35 nanosecond width can be put on a 50 microsecond video scanline, that resolution is about twice the Amiga's (at over 700). So the Amiga's resolution is about 70 ns. (Just in case someone asks.)

Conclusions

Let's wrap it all up.

Video resolution measures by lines per picture height which is 3/4 of the actual number of lines measured on a horizontal scanline.

For every 80 lines you measure, you get 1MHz of bandwidth.

Computer resolution measures the number of pixels on a scanline within the borders of the display area.

The minimum time it takes to display a pixel is often measured in nanoseconds. I've included a chart of common resolution measurements for your use. I

(continued)

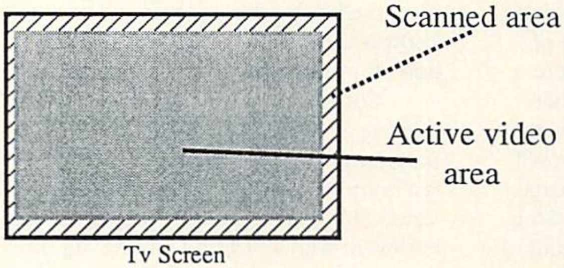


Figure One
Active Video Area

NTSC standards demand using several scanlines for sync and other special information, but not for video. Because of this, the number of vertical scanlines reduces to only 482 scanlines for displaying video.

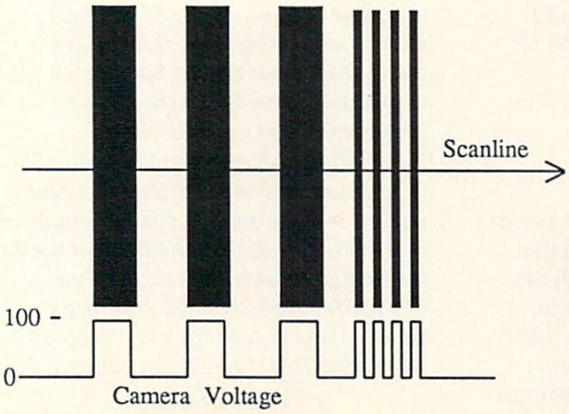
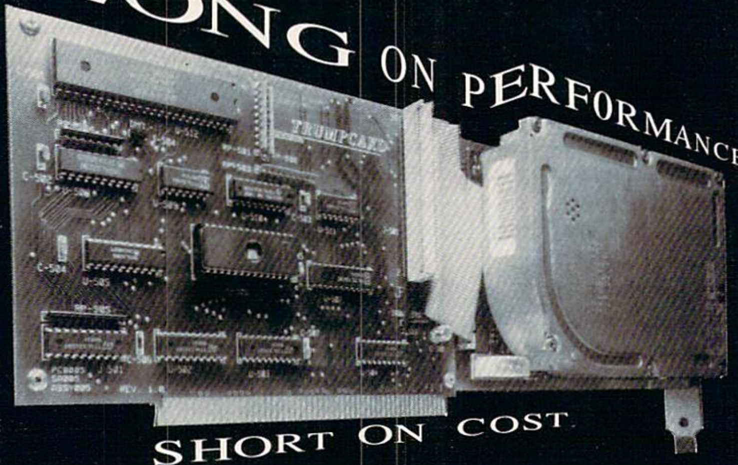


Figure Two
Horizontal Video Resolution

If we count all the lines—both black and white—that the camera can see in one scan, we then have our measurement of resolution.



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hope you're not too baffled by all this. It's quite straightforward. Still, many computer and television engineers don't even know how to relate one type of resolution to another. I must admit to discovering a few things myself while researching this column. Just follow the conversions I have provided and you'll always be speaking the same language. I'd like to thank Rick Seaman and Greg Sorenson of Magni, Inc., Steve Brandt of Tektronix, and Dave Duffield of Thompson Consumer Electronics (aka RCA) for their patience and help in putting together this material (to say nothing of their amazement that anyone would attempt to put all this in one column).

Coming up soon: Interlace. Why have it?

VidBits

If you haven't been to your dealer lately, you probably haven't seen the new 1084S "D" monitor. Although the designation is the same, the monitor isn't. Oldtimers will recognize the old 1080 monitor, which in most users' opinions had higher resolution than the original 1084. The updated "1080" has been equipped with stereo speakers. Also, the bright, sharp screen we used to know is there. Congratulations Commodore, for opting for quality!

Congrats also to Shereff Systems for offering a new character generator program so soon on the heels of their last entry. Pro Video Gold replaces Pro Video Plus (I can't wait for programs and hardware with a SUPER DELUXE tag on their names). Pro Video Gold features all the incredible functions and abilities of PV+, with anti-aliasing and severe overscan operation added. Anti-aliasing means your fonts will look as if they were drawn using more and smaller pixels than are available. Smoother curves and slanted lines drastically improve the text on your screen. Although Broadcast Titler is said to offer this feature, it looks as if Shereff Systems will get it to the market first. A complaint of PV+ users was that any IFF pics used for backgrounds were limited in size to 672 x 440 pixels. Now you can use the Deluxe Paint default for video page size, 704 x 480. This should help improve the coverage of a background picture. Registered users of PV+ should know they can upgrade to GOLD for only a small charge (10 or 15 bux).

One last note: Many users have found that the 2090A hard drive controller card has a timing problem when working with overscan programs. Pro Video Gold has taken steps to avoid the problem, and now report that a 100-page job save is quicker than ever. In fact, on an Amiga 2500, expect it to be as little as 2 seconds!

'Til next month!

•AC•

Send your video questions to:

Oran J. Sands III
c/o *Amazing Computing*
P.O. Box 869
Fall River, MA 02722

Roomers

by The Bandito

[The statements and projections presented in "Roomers" are rumors in the purest sense. The bits of information are gathered by a third party source from whispers inside the industry. At press time, they remain unconfirmed and are printed for entertainment value only. Accordingly, the staff and associates of* **Amazing Computing™** *cannot be held responsible for the reports made in this column.]

Amiga developers for sale? Well, they haven't exactly broadcasted it, but a couple of the larger software developers who made their names in the Amiga market are entertaining offers. No names, please — it's a delicate situation. Kind of like those anonymous personal ads you see in newspapers: *"Svelte, sensual Amiga software company with lively products seeks healthy, generous, big-time software firm with large distribution. Must like graphics, computer music, animation and undercapitalized companies with cash-flow problems. Object: matrimony. Send reply and photo to Box A."* Some interest from the big software companies on the make, but no firm offers yet.

Why are these Amiga software developers for sale? The pat answer is that sales are poor. But that's only a surface explanation. Mismanagement is closer to the mark, since most companies are experiencing strong Amiga software sales now. Their failure appears to be the result of overly aggressive spending on marketing and new product development, combined with a failure to get the products out to help pay for it. A sure warning sign of such problems: lots of advertising (for many months) for products that haven't yet shipped, indicating that marketing is sadly out of sync with product development.

Latest news in the video game shootout: Atari Corporation (*not* Atari Games, but the makers of the ST — you remember the ST.) has filed an antitrust suit against Nintendo for a cool $250 million dollars. According to Atari's statement, Nintendo prevents developers from selling versions of Nintendo games to other video game companies. In effect, Nintendo is keeping a stable of developers to itself.

More to the point, Atari can't publish 2600 or 5200 versions of the best-selling Nintendo games. So Atari is trying to get Nintendo to allow that while, at the same time, Atari Games is trying to get the right to make Nintendo cartridge clones. Nintendo called Atari's suit "meritless and simply an attempt to excuse Atari's poor competitive performance in the marketplace." Ouch. Adding insult to insult, Howard Lincoln, Nintendo's senior vice-president, said, "Atari's lawsuit is simply sour grapes by a company that has failed to capitalize on its past position as the market leader." The days of whine and roses are over, it seems.

The games that time forgot

Not to be outdone in the armaments battle, Nintendo has fired a long-range cruise lawsuit at Atari Games, charging patent infringement. This, of course, refers to those cartridge clones that Atari Games is now manufacturing. This whole affair reminds the Bandito of dinosaurs battling in the swamps, while fearful computer game software companies play the role of the mammals cowering in the mud waiting to go in and gnaw at the bones of the defeated behemoths.

Taking the analogy a bit further, those old Atari cartridges, which became landfill in Arizona after the first Videogame Crash, turned into the metaphorical oil that fueled the growth of the entertainment software business. Nintendo is fighting to keep from becoming the gasoline of the next generation, and to keep their machines out of the Cabbage Patch (that is from #1 toy one Christmas, to Chapter 11 the next). Of course, their executives will tell you at length how Nintendo isn't really a craze—it's different, and lasting; an enduring monument to man's creativity, that sort of thing (well, maybe not in those words). Seems to the Bandito those same descriptions were being used in the early '80s in Atari's heyday, right before the Crash. Funny thing, Nintendo's sales for last year were getting close to what Atari's were at the peak of their business. Remember what Santayana said about history repeating.

Seems like there's a new strategy in the computer business — if you can't beat 'em, sue 'em. Apple is trying that tactic right now against Microsoft and Hewlett-Packard. It's happened (and is happening now) in the Amiga market, too. The Bandito thinks companies who believe lawsuits are the road to riches should spend their money on new product development, rather than on lawyers. Give up the lawyer racket and get an honest job—like figuring out how to get kids to part with three months of lawn-mowing money for the latest shoot-'em-up game.

Color fax machines are on the drawing boards now that the fax machine market is in high gear. What could better serve as the basis for a color fax setup than an Amiga? Maybe some bright engineer will make a faxmodem card for the A2000, and support color. With that and a digitizer, you're all set. The Bandito hopes that someone goes to work on this right away, so the Bandito can send color junkfax for Christmas.

More software imports are coming from Germany and England. U.S. companies are looking to Europe for more Amiga products, since they cost less (for the most part). Expect to see distribution deals inked soon between some of the small European companies who have tried to market their stuff here and established American companies like Electronic Arts and Cinemaware, among others. For the eager game consumer, this means even more game software than before. Still no assurance of quality though. It's a veritable minefield out there on the retailers' shelves, and packaging is no help. Some of the best games hide in the most atrocious wrappings, while many a lovely cover conceals Commodore 64 games clumsily ported to AmigaBASIC. This is where it really helps to have a local retailer who is willing to take a game out of the wrapper and show it off, so you can take a look before you buy.

(continued)

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From the Beginning

Since February 1986, Amazing Computing™ has been providing users with complete information for their Amigas. This store house of programs and information is still available through our back issues. From the Premiere issue to the present, there are insights into the Amiga any user will find useful. AC was the first magazine to document CLI, tell its readers how to connect a 5 1/4 IBM drive, describe a 1 meg upgrade hardware project for the A1000, and many more. Please read the list of topics AC has covered below to find the information you have been missing.

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Superterm V 1.0 By K. Kauffman A term. prog. in Amiga Basic
A Workbench "More" Program by Rick Wirch
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Deluxe Draw!! by R. Wirch An Amiga Basic art program
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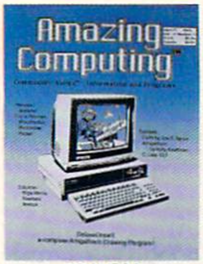

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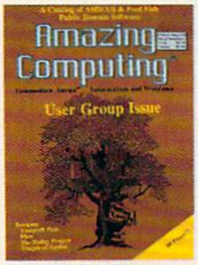

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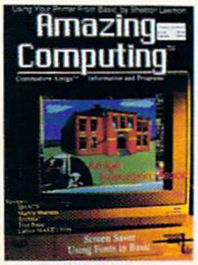

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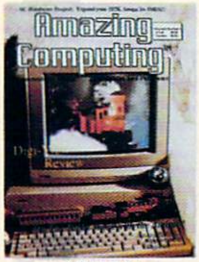

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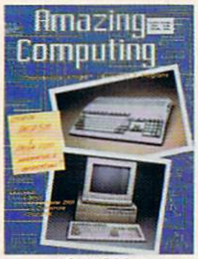

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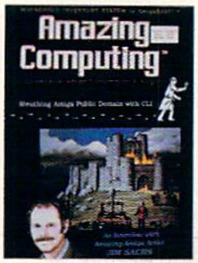

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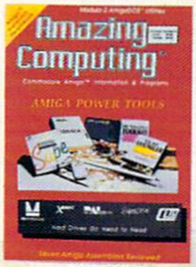

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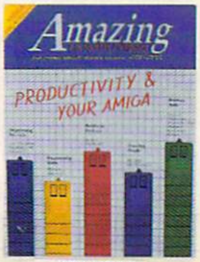

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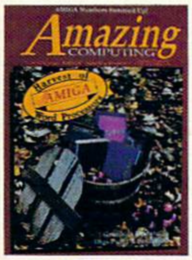

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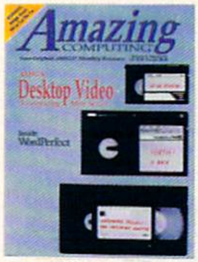

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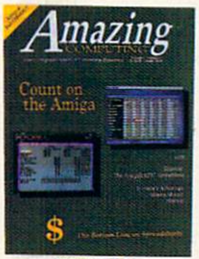

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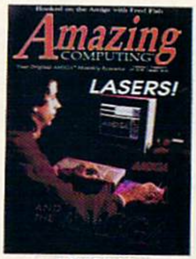

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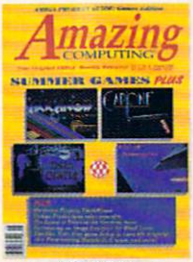

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While the Bandito dearly loves games and wishes more of them would multitask discretely, a few things could be improved. Game makers, it's OK to use digitized images, but make sure you clean them up, all right? Nothing is tackier than a sloppy digitized face or background. And if you must port a game from another CPU, bring the graphics and sound (if not the gameplay) up to the level of the Amiga. The Bandito could forgive some of the transgressions in the early days of the Amiga (*Seven Cities of Gold* comes to mind as a painful example) as youthful exuberance, but there's no excuse anymore. The Bandito is ready to scream at the next Sega game port seen on an Amiga monitor. Few things are more terrifying than seeing the Amiga being cruelly transformed into a Sega game machine. Have a heart, fellas.

On the brighter side, have you noticed how more games are really using the Amiga's power? In recent game releases, the Bandito has seen overscan, extra halfbrite, HAM, continuous sound tracks, and stereo sound effects. Not all in the same game, of course, but perhaps someday. The ultimate game experience is an Amiga hooked up to a giant-size TV with a heavy-duty sound system. Those pixels practically crawl right out and grab you. If you have that, who needs to go to an arcade?

Commodore Productivity

The latest news about Commodore is very good. In a recent study measuring productivity of computer companies by sales per employee, Commodore came out #2, right behind Apple. IBM was a distant, dismal also-ran. Commodore is running lean and mean these days, and is racing to get rid of the debt they acquired. Did you see the latest stock quotes? Commodore stock almost hit 18, which is amazing for a stock that bottomed out at 4 a couple of years ago. The Bandito thinks you should stick around for the ride — next stop, $35/ share.

All this is music to the ears of the old Amiga employees who held on to their Commodore stock. You see, they got paid for Amiga in Commodore stock and extensive options at around $10 a share (some were at $12), and after the deal was consummated, Commodore stock promptly dropped down to the $5 range and stayed there for years. Now, the original Amigans can finally get some profit out of the deal. That is, if they didn't already sell the stock...

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An easier hard drive setup?

On the hardware side, the Bandito has been hearing some grumbling about how difficult hard drive setup is. While it's not quite as arcane as configuring an IBM hard drive, it's pretty darn close. That's one advantage the Macintosh has — their hard disks come preformatted, just plug and play. Of course, they're more expensive, too. Anyway, Commodore should work on the WorkBench and their hard disk setup. The Bandito would settle for having an easy-to-use piece of software that holds your hand through the setup process.

Any chance that Commodore will do this, or will the third-party developers (as usual) beat them to the punch? There's no reason why Amiga can't make the process easy and give you more control over how you want to partition your hard drive. Let's be the leader of the pack, rather than the follower.

While you're at it, make sure that icons are always created for files. Why force everybody to go to the CLI to find a file? On the Mac, everything has an icon. Even if the program doesn't provide for it, the system software takes care of it. The Amiga should do this as part of the project to make life easier for new Amiga owners. Let's not force everybody to become CLI wizards. If you want to do that, buy an IBM.

68030 Amiga?

Speaking of leadership, how about getting the 68030 Amiga to hit the market this year, with Commodore putting some marketing behind it? With the right add-ons, they could really go after some of the Mac and IBM workstation markets. Besides, the 68030 means hardware memory management, which can make multitasking bulletproof. Commodore should look to the future and try to standardize on that platform, so AmigaDOS can really kick butt. OS/2 is off to a slow start, and Apple needs to rewrite their System software entirely, which will take them a couple of years. It's a golden opportunity for Commodore to really get

(continued)

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ahead in the marketplace. Think of how the software would shine on a 68030 platform! Maybe it will come down to a price that the Bandito can afford. By the way, it looks like Commodore has a hit with their new 68020 Amiga. The A2500 is shipping as fast as they can build them. Give those customers a little power, and they'll want even more. Think what a 68030 version would do.

At the other end of the hardware spectrum, Commodore is preparing for the impending arrival of Amigas in the mass market chains. Will there be a lower-cost A500 or the videogame version that the Bandito heard about? The jury's still out at Commodore, though efforts are continuing to reduce the manufacturing cost of the A500.

Some people inside Westchester are now calling for turning the C64 into the dedicated game machine rather than the A500. After all, it is better than a Nintendo. There is already a big installed base of hardware and software, the distribution is already in place, and the profit margins are there. All that needs to be done is some re-engineering of the C64 and getting the software manufacturers to put their games on a cartridge. Commodore may have to do that to keep the C64 alive. Although it had a good Christmas, observers are wondering if the venerable 64 can make it through another year.

Finally filling the slot left by Tom Rattigan's departure, there's a new president at Commodore: Mehdi Ali, former managing director of Dillon, Read in NY. Other past work experience includes VP at GM and PepsiCo (take that, John Sculley).

Commodore is getting more aggressive about their PR efforts, which is good news. Part of the reason you've seldom seen articles about Commodore in the mass media in the past is they've been very tight about letting sample Amigas go to members of the press. Now, Commodore is loosening up a bit, and more hardware is going to important magazines (especially professional magazines). Now the magazines can review the Amiga and its software and hardware add-ons and, as a consequence, Commodore is getting more press. We may yet see Commodore accorded the same recognition Apple gets, which is far too much if you ask the Bandito. Apple's success with the press stems mainly from its cute name and the fact that it was started in a garage.

The list of Amiga developers trying to make money in the Mac market is growing, but none of them have yet turned a good profit. Marketing costs are very high (about the same as in the IBM market), and they don't seem to realize it's getting tougher all the time to break in.

A lot of big software companies are trying to make it in the Amiga market, and are not making any money yet — people like Ashton-Tate. Some Amiga companies with Mac products are Aegis, Byte-By-Byte, MicroIllusions, and New Horizons. The Bandito wishes them good luck, and hopes it isn't too painful finding out that creating a hit program in the Mac market isn't simply a matter of recompiling the software and adding $200 to the price.

For instance, Aegis' Video Titler is priced at $495 for the Mac, and it requires a Mac II with 2 megabytes of memory, color, and so on — about $6000 worth of hardware total. Cheaper to buy an Amiga and the Amiga version of their software if you ask the Bandito. Plus you get to play great games.

Apple IIGS sales are reportedly slowing down in a big way. In fact, the situation is getting serious for the whole Apple II line. Hardware and software sales have slowed to a crawl, and none of the big software companies are developing any important new software for the IIGS platform. They've already reached the performance limits of the machine, and the software they have doesn't sell very well, so why bother?

The problems go even deeper. Pressure is building at Apple to bring out a $1000 retail price Mac Plus, and get rid of the Apple II line for good. They may do it as early as January 1990. What does this mean for the Amiga? Just that one more competitor for the home market bites the dust, leaving Amiga battling against the Clone Armies.

While the Clones have tremendous numbers, when you get down to price performance, the Amiga 500 competes very well. Let's say you can get an A500 with 1 meg, two drives, and monitor for $1200, while you can get a Clone with a 10 MHz 8088, 640K, a 360K drive and a 720K 3.5" drive, and an EGA monitor and EGA card for about $1200. The Bandito guarantees that the Amiga will rip the

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Clone apart on any performance test you care to name, not to mention the Amiga's obvious graphics, sound, and multi-tasking advantages.

If Commodore can get the word out, why should anybody buy a Clone for their home? Oh, wait, there is one thing — data compatibility with their MS-DOS machine at work. Well, Central Point's DOS-to-DOS can fix that. Better yet, maybe Commodore should buy the rights and make it official, or come out with their own version. Then the Amiga could really go for the throat of the home market.

HyperClone?

A HyperCard clone for the Amiga? Several contenders are testing versions right now. The Amiga makes a much nicer platform, what with animation, stereo sound, and color graphics standard. Why should the Mac have all the fun?

In the realm of financial reports, Mediagenic had a dismal holiday. They reported net income fell in the Xmas quarter, while sales rose. Sales for the quarter were $19.2 million vs. $12.2 million for the year earlier, while income is $600K versus $800K for the year earlier. That's not much of a profit margin to write home about. But they're trying to revamp their product lines, and are promising some really good games for the end of the year. We'll see.

More from the Battlefield

Paint Wars Battlefield Update: It looks like April is show time, when all the major contenders will take the field to battle for market share. In an interesting new twist, it looks like DeluxePaint III will actually get some advertising, though it's not nailed down yet. Until then, everybody's paint program sales have slowed down in anticipation of the new versions. Once again, the consumer will be the winner in the feature-packed battle for control of the graphics market. Stay tuned to this Bat-channel for details.

One developer is trying to get away from the Amiga name in a professional market, and they rejected an offer to show in Commodore's booth at an upcoming trade show. They didn't want to be associated with the Commodore name; they're afraid the buyers won't take them seriously. You'd think Commodore would take a hint.

The latest word from Epyx is their top-secret project is definitely a videogame. The bizarre twist in this is the Bandito's informant swears up and down (in x and y, that is) that it's a handheld device. What's that? A controller, or the actual game unit? What kind of screen does it have? Curiouser and curiouser, says the Bandito. When the data get weird, the weird get data.

According to an internal memo, Commodore has shipped the magic millionth Amiga (that's shipped, not sold). Congratulations! That should make more developers sit up and take notice. Just to put things in perspective, there's a little over 2 million Macs in the world, and about 18 million IBM clones. On the other hand, there's only 800,000 laser disc players. One million is a very respectable number of units, and hopefully Commodore can parlay that into more hardware and software support from outside developers, so the Bandito has more neat toys to play with.

•AC•

SNAPSHOT

Hot Amiga Game reviews

by R.B. Andrews

This is the first in a new regular feature in AC. Each month, I plan to cover four recent game releases for the Amiga. I'll try to help you understand what the reviewed games are about, while also evaluating the pros and cons of each one. Since no game I know of is either totally bad or completely flawless, this coverage should help you decide if the game would be enjoyable for you to play. And now, on with the show.

Virus

First on the list this month is Virus, by Rainbird Software. In Virus, you must pilot a hovership in its attempt to fight off wave after wave of different mutating genes threatening the planet. No one knows for sure where these mutants originated from, but you must fight with all your skill to prevent them from infecting the entire world. As the virus is spread over the terrain, it mutates and becomes lost forever.

The Enemy Fleet: Mutant ships come in several varieties. Seeders simply fly low and spray the virus, landing occasionally to cover an area more thoroughly. A Drone will shoot at both the hoverplane and the landscape, then attempt to mutate itself by absorbing a healthy tree. This mutated drone will then seek out and attempt to destroy the hoverplane in any way it can.

A Bomber flies at high altitudes, dropping large quantities of the virus that can quickly mutate entire sections of the planet. A Pest's only goal is to destroy you at all costs, which it can do very effectively. A fighter is your hoverplane's, alien counterpart. It will try to out-dogfight your ship so the overall invasion can proceed.

The last ship is the deadliest of all. The Attractor has a built-in tractor beam which drains the hoverplane's energy, causing it to crash. It takes several hits to destroy this menace. Luckily, only a few exist.

Fighting off the invasion would be a totally lost cause except for the fact that a virus-free landscape is generated for the fifth and tenth waves. But this benefit is balanced out by the increase in gravity in waves three, five and seven, making control of the hoverplane even more difficult.

The game features smooth scrolling and solid three-dimensional graphics. Several added touches, such as the flying fish occasionally seen jumping out of the water as you fly by, spice up gameplay. The sound is complimentary and up to Amiga standards.

You can use either the keyboard or the mouse to control the hoverplane during flight. However, the keyboard is much easier to use. This brings up the main failure of the game. Learning how to effectively control the hoverplane is a nearly insurmountable task. The mouse moves the plane in unintuitive ways. And flying using the keyboard requires that you access many keys—a task difficult for all but the most adept keyboard jockeys.

The game's graphics and sound are almost impressive enough to make Virus a top-notch game. But the difficulty of the game's controls limits Virus' potential audience. Those who can master the controls are in for a very enjoyable playing experience. Others, like myself—and probably 90% of Amiga users—are probably not so adept and should limit their enjoyment of the game to watching the demo at the computer store, or watching a friend who can play it effectively.

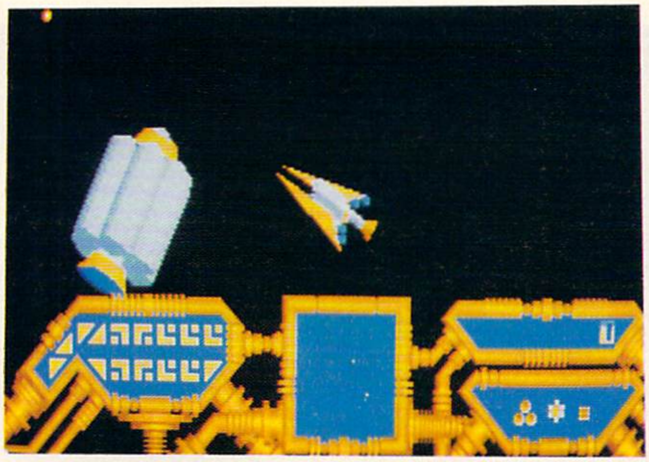
SpaceCutter

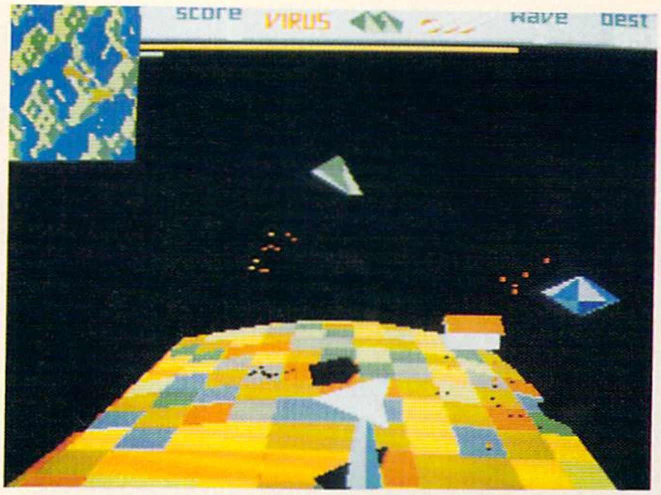
In SpaceCutter, also by Rainbird, you have managed to steal a powerful fighter ship from your captors and escape to the Whirligig, an interconnected series of distinct areas called Eigen spaces. Within this network of over four billion spaces lie the five perfect solids. Capturing all five of these will completely free you from your enslavement and return you to Earth's golden era, 1988.

Your ship is a highly maneuverable Meson class fighter. It is equipped with missiles and chaff pod. However, its most important cargo is the fuel it carries. Fuel is used to change your momentum and the speed and direction of your ship. If your fuel supply runs out, you will find yourself drifting forever in the direction you were last heading. Fortunately, there are fuel depots throughout the network, to allow for refueling. Also, you begin each game with 12 hulls (lives), so you can switch control to a remaining hull if necessary.

Intelligent Ships: The enemy is a race of intelligent mechanical ships that have enslaved most of the human race. There are over 100 billion of them in the Whirligig alone, and their sole mission is to terminate you. Some are simple passive vehicles that fly along a fixed path, posing danger only in the case of accidental collision. Others appear tame at first, but will fire missiles if your ship passes close enough.

The most dangerous are the ships-of-prey, which wait in fixed locations to ambush your craft, relentlessly dogfighting until one of you is destroyed. Although you can destroy most enemies with your missiles or chaff pods, some are indestructible. You can only escape them only by traveling through one of the many stargates connecting the sectors in the network. As might be expected, the enemies are simple to defeat in the earlier levels. But the higher the sector number, the more dangerous the opponents, until they are nearly unbeatable at the highest levels.





(Left) ***SpaceCutter*** *features sharp three-dimensional graphics*

(Right) In ***Virus***, *you must pilot a hovership in its attempt to fight off wave after wave of different mutating genes threatening the planet.*

Nothing is left to chance in SpaceCutter. Numerical functions govern everything from the network connecting the Eigen spaces to the location of the supply depots.

SpaceCutter also features sharp three-dimensional graphics. However, travel is only in two dimensions. This may seem limiting, but it works well in practice and is easy to grasp conceptually. The sound is also similar to that in Virus, quite adequate for the task at hand. Controlling your ship is much easier though. After a brief pilot training period, most players will find themselves reaching the first perfect solid without too much trouble. But reaching the other four solids will take some time. Only the most dedicated will capture all five and complete the game.

The size of the view screen can be frustrating even though it takes up the whole monitor. If you fly at a reasonable speed, enemies can seemingly "jump" onto the screen and kill you before you even have time to react.

Try this game before you buy it. If it appeals to you, it can easily provide many hours of enjoyment.

Operation Cleanstreets

Operation Cleanstreets puts you in the role of "Cleanup Harry," a tough cop with a tough mission: Free the city from the stranglehold of five different criminal rings which currently control all aspects of life. Facing one gang at a time, you must free each of nine distinct areas from gang control, and burn any contraband you recover.

Opposing your operation are the many thugs and hoodlems employed by each ring. The first group, the caffeine ring, are relative pushovers. However, the crime rings get progressively harder until you reach the final group, the arcadoine ring, which is nearly impossible to overcome. Some opponents are armed with only their fists, while others wield clubs or whips. One even carries a samurai sword. Your only weapons are the punches and kicks that have made your name feared throughout the ghetto.

Thugs and Drugs: Thugs carry packages of drugs you can recover after you defeat them. You must then burn these parcels to remove them from circulation and give your character renewed strength.

You can use either a joystick or the keyboard to control the on-screen character. Both methods work reasonably well. There is a problem with the responsiveness of the controls at higher levels, though. The opponents get so many opportunities to move that by the time you attack, the enemy has moved out of range—after hitting you several times. This makes play in the upper levels worthless, and the fifth ring impossible to beat.

Unfortunately, the game's fine graphics cannot rescue it from its limited theme. While both the background settings and the on-screen characters are rendered very effectively, the game can quickly become boring, with only nine areas to clean out, and each level simply adding more people and hazards to each of these nine areas. The game could be enjoyable for the right person, but I would strongly encourage you to "try before you buy."

World Tour Golf

World Tour Golf is Electronic Art's first entry in this popular area. It has many of the features we have come to expect in games of this type. You can play many famous courses, and the game even lets you construct new courses.

The playing screen features both a "birds-eye" view of the hole and a perspective three-dimensional view from your current ball location. The mouse aims and performs the actual shot. The aiming is a bit too course though. There is no way to make slight adjustments and, often, the default aimpoints are not quite what is needed. It takes four clicks to carry out each swing, and clicks must be performed with careful timing for an optimal shot.

With practice, this works well with longer shots. However, chipping the ball short distances can be very difficult, since it is extremely hard to make all the necessary clicks at the right times without slicing the ball badly. Keyboard controls are also available to perform "perfect" swings of preset strengths.

The graphics themselves are acceptable. They are crisp and clear but do not really stand out. The sound also compliments the game, with enough noises included to add to the feel of playing on a real course. At the end of each hole, the crowd will cheer if you have done well, and sigh if you bogey (or worse).

World Tour Golf does a reasonable job of portraying the vagaries that face even the most experienced golfer. No

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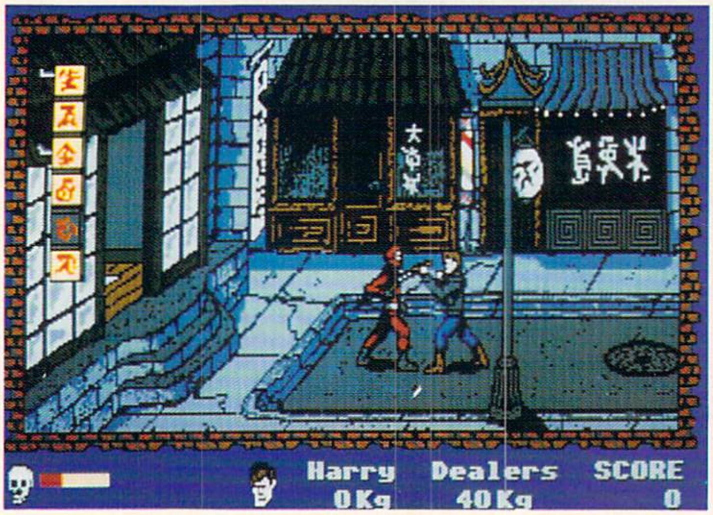

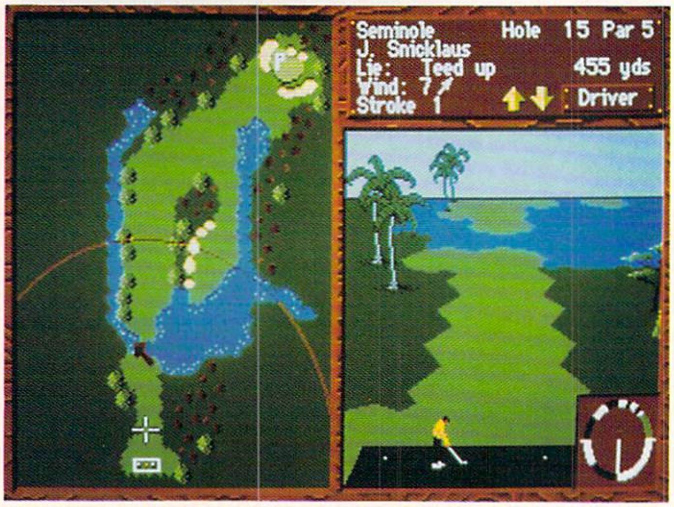

(Left) In ***Operation Cleanstreets****, you must free each of nine distinct areas from gang control, and burn any contraband you recover.*

(Right) ***World Tour Golf*** *does a reasonable job of portraying the vagaries that face even the most experienced golfer.*

matter how good a swing, some shots just won't go where you plan. Though frustrating, this is a sign of a good simulation and thus a desirable feature.

Custom Courses: The course builder is probably the best part of the game. The player begins by constructing the general layout of the hole. When the player is finished, the computer smooths out this blocky layout and produces a very attractive overhead map. A wide range of pre-drawn trees, sandtraps, and other objects allow even the most unartistic to produce a nice-looking hole.

Unfortunately, when viewed in its entirety, the game falls short of the standards set by other golf games. Although it is a fine game, it lacks that special feel necessary to make it truly great and worth your hard-earned cash.

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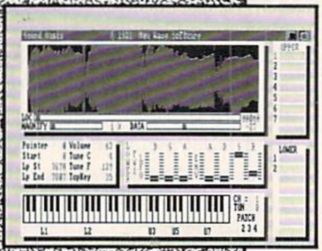

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The internal sound capabilities of the Amiga are better than that of any other personal computer. These capabilities mean nothing though, without quality digital sounds, which up till now have been scarce. Sound Oasis gives Amiga owners access to a large library of studio-tested digital samples, by using the Amiga's built in disk drive to read disks made for the Mirage Digital Sampling Keyboard. Sounds can then be played from a MIDI keyboard, the computer keyboard, or saved as an IFF standard file. Mirage is a trademark of Ensoniq Inc.

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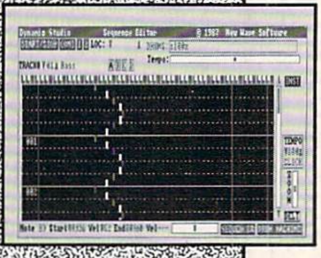

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C Notes *from the C Group*

Programmer's Lingo!

by Stephen Kemp

Computer programmers can be a humorous bunch—at least to other programmers. Other people (from other departments) just barely think we're human, much less humorous. Programmers are referred to as wizards, techno-weenies, and caffeine junkies, but seldom as a fun bunch of interesting people. That's okay, though. Because when a bunch of programmers get together, they can keep each other laughing for hours on end with a conversation that wouldn't mean a thing to outsiders. (This would probably be true for a room full of bankers, too, but I'm not talking about them.)

Foreign Languages

Of course, a good deal of a programmer's lingo involves acronyms that have been derived from computer languages or applications that programmers write. Now everybody encounters acronyms in their daily lives. At home there's the TV, VCR, and CD player. Occasionally, we are invited to parties that are RSVP or BYOB. College students worry about their GPAs. And working folks can't wait to say TGIF. But most likely, nobody encounters acronyms more often than computer programmers.

A typical programmer deals each day with acronyms like PC, DOS, ROM, WORM, BBS, and others. These are fairly basic and universal acronyms, and almost anyone in the computer industry recognizes them. Some acronyms, however, mean more to certain programmers. A word like WYSIWYG (pronounced WIZ-E-WIG and stands for What-You-See-Is-What-You-Get) may not mean a lot to a programmer who specializes in accounting software, but it can represent the ultimate goal for a programmer specializing in word processing software.

Acronyms like these emerge because programmers tend to be cryptic (a side effect of programming). After hearing (or saying) a phrase several hundred (thousand) times, it just seems natural to shorten it down into an acronym. Each one is placed into the computer-lingo dictionary, and usually gets recalled at the most opportune of moments.

At my workplace, we hear phrases that lead to acronyms all the time. Our work not only involves application programming (we developed a 4th generation language and a series of add-on utilities), it sometimes involves some tech support, BBS support and, of course, management confrontations. This has given rise to some new acronyms around our office that you might want to add to your own personal dictionary.

YKWWBRN (YUK-WA-BURN) - If you are involved in application programming, you have probably heard this first item without even realizing it. Almost every discussion about the project that someone is working on begins with the phrase, "You Know What Would Be Really Nice?" And is usually followed with the most trivial of drivel you have ever heard.

SIWY (SEE-WEE) - Have you ever worked long and hard on a project, only to see it explode in your face while doing a demo for someone important — like your boss?! This is when you say, "S—t. It Worked Yesterday!"

WOKOMS (WO-KOMS) - This phrase occurs after you give someone a copy of your product. No sooner do you get settled into your office chair before the intercom buzzes with, "Hey, it doesn't work right!" This is when you reply, "Works OK On My System! You must be doing something wrong!"

INABIAF (I-NA-BEE-AF) - This one is a great avoidance technique. When you get tired of answering questions or making revisions to the same program, don't forget to say, "It's Not A Bug, It's A Feature!" Sometimes they will believe you.

IKIWO (EK-EE-WU) - Have you ever hunted up that utility you wrote a year ago only to find it doesn't work anymore? That's when you say, "I Know It Worked Once."

NBNS (N-B-N-S) - This one actually originated from a Gary Larson comic (my favorite comic artist). It stands for "No Brains, No Service!" We use it (only internally, of course) to refer to those occasional customers whose bulbs don't reach peak wattage. Someone usually perks up with, "Are they aware of our policy of No Brains, No Service?"

USE (USE) - A friend from Motorola brought this little gem to my attention. Have you ever been running a program (perhaps one you wrote), and you see something out of the corner of your eye that should not have happened? What was that? Did you see that? This sounds like a definite Unidentified Software Event. I suppose that if you can get it to happen again, it then becomes a RUSE—a Recurring Unidentified Software Event.

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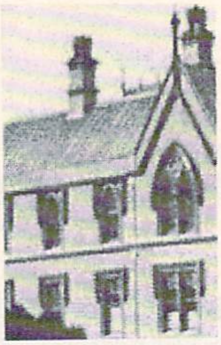
Section of a
typical Amiga print
(shown actual size)



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SUFCOT (SUF-COT) - Sometimes it is hard to deal with a manager or salesperson who keeps wanting a product changed. They always say (with a smile on their face), "This wouldn't be too hard to do, would it?" This is when it is time to reply, "Sign Up For COmputer Time." If it's not too hard, then they should be able to do it. Don't you think?

Hold The Phone

Well, so much for acronyms. They are an integral part of the lives and humor that programmers encounter. Still nothing can beat a good anecdote. With everybody gathered around, programmers can swap stories faster than old ladies at the picket fence. At a place where I once worked, they swore the following story was true.

One day a tech support person received a call from an anxious user. While attempting to calm the customer down, they determined that the user had just installed the product and had now reached an impasse.

"How does the screen look right now?", asked the tech person.

The user responded, "It says, 'Press Any Key To Continue'."

"And", asked the tech person, "what happens after that?"

The exasperated reply from the customer was, "I can't get past this screen! I've looked all over this keyboard, and can't find the Any key!"

Then there's the user who calls in with an installation problem...

"Yea, uh, I did what the screen said, but things stopped working."

"Okay, let's backtrack," said the tech. "What happened after you put in disk 1 and pressed the start key?"

"Well, it did some stuff and then it said to put disk 2 in Drive A."

"Okay, did you do that?" inquired the support person.

"Yea, but that's when it quits working. Should I have taken that other disk out first?"

This next event was the most recent that tickled our funny bone.

"Hello, Tech Support? I wrote this program that generates a random number that I place into a customer record, and everything worked fine for a while, but now my random number isn't working anymore. Is it possible that my computer has run out of random numbers?"

Unfortunately, they wouldn't let me call him back to offer him my $200 program that I just wrote to regenerate the random numbers in his computer.

Working in a Fish Bowl

Although we programmers don't seem to get a lot of respect (or credit) around the workplace, management just loves to show us off to every visitor. Does this tour package sound familiar?

"This is where we keep the programmers. See! There's one over there! Now don't put your hand in there, you don't know where they've been. And please don't feed them. We give them a special diet of caffeinated drinks and candy bars. They're in peak condition. Why, they can solve any problem put to them. Some of them even know a few tricks. Watch this Stephen, speak to the nice person..."

Boy! Talk about your fish bowls. Sometimes it makes you want to lunge for their throats. And we would too, except the leash doesn't reach the door from where it's attached to the desk. Does this happen to any of you? Kinda makes you want to pick you nose while they're watching, doesn't it?

It's a Wonderful Life

I suppose it doesn't really bother me what people think of programmers. I do it for the challenge. (I would do it for the money, but there's more challenge than money.) We work in an environment that to most people seems magical, and I love it. And nothing gives me greater pleasure than blurting out a few acronyms in mixed company, or relaying a humorous story that others don't understand. Nothing, that is, except writing a program. Programming is my life. Programming has been very, very good to me.

This has been a slight diversion from my usual topic of C programming. Next month, it is back to work as usual.

P.S. Contrary to popular rumors, I have never been "convicted" of detonating a thermonuclear device of greater than 10 megatons in, or around, a major metropolitan area with a population greater than 2 million persons. So stop repeating the rumor.

•AC•

Passing Arguments to AmigaBASIC Programs from the CLI

Pass data from CLI to the BASIC program using script files and a special AmigaBASIC subprogram.

by Brian Zupke

The following article is a step-by-step tutorial on how to invoke AmigaBASIC programs from the CLI and pass arguments to them.

In general, most computer programs perform two fundamental functions. They take input data and they provide output data. For example, word processors take input from the keyboard and print out documents. Games read the joystick, mouse, and keyboard (input) and update the screen (output) based on the inputs and the state of the game. These programs take their input data during execution.

In the Amiga Disk Operating System (AmigaDOS) environment, most of the data the DOS programs input comes from the CLI when the programs are executed. For example, the "type" command gets the name of the file to print and where to print it from the command itself. The command:

```
>type readme to prt:
```

causes the file "readme" to be printed on the printer. There is no control information input to the "type" command while executing.

The ability to enter all the necessary input at a program's startup time has advantages. You don't have to wait until the program loads to enter the information. A program getting all its data from the command line can be executed without further human intervention. Programs can be invoked from a script or command file, like the "startup-sequence" file in the "S" directory.

AmigaBASIC programs can be loaded and run automatically from the CLI by entering the program name after "AmigaBASIC". However, there is no built-in way to pass data from CLI to the BASIC program. AmigaBASIC programs must first be loaded and then request the necessary data. This obstacle can be overcome using script files and a special AmigaBASIC subprogram. This method is patterned after the way arguments are passed to "C" programs.

C uses a standard method to pass arguments to programs. The model below shows a typical format of a C program.

```
/*  Typical C Program Format  */
main( int argc, char *argv[] )
{
   (statements)
}
```

The two arguments "argc" and "argv" in the above example contain all the arguments entered with the program name on the command line. The variable "argc", known as the argument count, is equal to the number of arguments entered, including the program name. Therefore, the value of argc will always be at least 1.

The variable "argv" is known as the argument vector. It is an array of pointers, each pointing to an ASCII string of one of the arguments entered. The element argv[0] will always point to the string containing the program name. With these two arguments, the program can determine exactly what was typed in at the command line.

Passing Arguments

Arguments can be passed to AmigaBASIC programs using the following method. First, the arguments to be passed to the BASIC program are stored in a temporary disk file. Second, AmigaBASIC is loaded along with the desired program, and that program is executed. Finally, the program reads the temporary disk file and processes the arguments originally entered. How is this accomplished? Well, let's take it one step at a time.

Before you start, prepare a work disk to use for the test script files and programs below. Make sure AmigaBASIC (on the Workbench Extras Disk) is in your work directory or in one of the directories specified by the PATH command. If you do not have a hard disk, I recommend you place AmigaBASIC in the RAM: disk and add RAM: to PATH if it's not already there. To add RAM:, enter:

```
>PATH RAM: add
```

If you do not have enough memory (AmigaBASIC takes up about 103K), then AmigaBASIC will have to reside on a floppy. In this case, you will not realize the full benefit of running BASIC programs using this method because of AmigaBASIC's longer load time. In any case, make sure the work disk/directory is the current directory.

First, we need to get the arguments into a temporary disk file. For now we'll create a text file using any text editor but, eventually, this action will be done more efficiently. Once you are in your text editor, type the following text on the very first line:

```
bozo buttons for everyone
```

then save the file as "RAM:test". This file now contains the arguments our BASIC program will use. Our first program will read the arguments from the temporary file and print them on the screen. Using a text editor or (dare I say) the AmigaBASIC editor, enter the following program and save it as "ReadArgs". Be sure to save it to disk and not to RAM:. Files stored in RAM: will be erased when your Amiga crashes or is turned off. We

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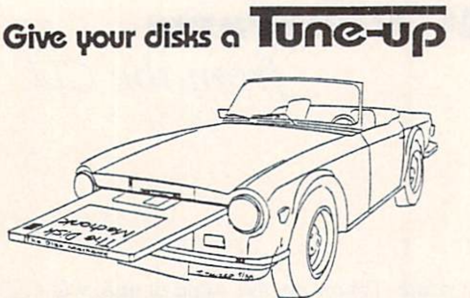

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Volume Name	TuneUp	BEFORE	AFTER	IMPROVED
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Diga!	3:45	9.44	5.22	80%
WordPerfect	4:42	12.36	5.37	130%
SuperBase	3:37	19.39	9.66	100%
data	1:43	14.30	4.68	205%
archives	3:40	28.43	9.52	299%

* Times given are the average of three runs on a standard A2000 internal floppy drive. The TuneUp time is the time required to process the disk (in minutes and seconds). The BEFORE and AFTER times are the time (in seconds) required to get a directory of the disk. The more use a disk has had, the better the improvement!

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put the argument list there since we really don't care if we lose it.

```
'
' Test program 1 to read arguments and print them out.
'
    OPEN "RAM:test" FOR INPUT AS #1
    LINE INPUT#1, Arguments$
    CLOSE 1
    PRINT "Arguments entered: "
    PRINT Arguments$
    END
```

The "OPEN" statement allows the program to read in the contents of the file "RAM:test". The "AS #1" indicates we will reference this file as file number 1. The statement "LINE INPUT" is used instead of "INPUT" to read the file in case the argument list contains commas. If it did, then the "INPUT" statement would split up the line into different fields (the comma separating them) and try to stuff them into different variables. Since only one variable is specified, only the text up to the first comma would be read in.

Once you've saved the program, enter the following line from the CLI:

```
>AmigaBASIC ReadArgs
```

This will load AmigaBASIC along with the program you've just created. Once the program has loaded, it will RUN automatically. You should see the following in the BASIC window:

```
Arguments entered:
bozo buttons for everyone
OK
```

Now, exit AmigaBASIC by entering:

```
SYSTEM
```

The next step is creating a script file to create the temporary disk file and load the AmigaBASIC program. Using the CLI "echo" command, we can send a line of text to a file by redirecting the output. Using a text editor, create the following file and save it as "Bozo":

```
echo >RAM:test "bozos are not bozos without their bozo buttons"
AmigaBASIC ReadArgs
```

The ">RAM:test" redirects the output of the echo command (text contained in quotes) to the file "RAM:test". Remember, by redirecting the output like this, we will destroy file RAM:test if it already exists. If you are using Workbench 1.3 (which you should to take full advantage of this technique), make the file "Bozo" an executable script file by entering:

```
>protect Bozo s add
```

If you are using Workbench 1.2 (why are you?), forget this step and use the CLI "execute" command whenever you want to execute a script file.

Now then, when you type:

```
>Bozo
```

(under 1.2, enter "Execute Bozo")

at the CLI, the text "bozos are not bozos without their bozo buttons" will be stored in the file "RAM:test". Following this, AmigaBASIC will be loaded along with the program ReadArgs. The ReadArgs program will then read the file "RAM:test" and output:

```
Arguments entered:
bozos are not bozos without their bozo buttons
OK
```

Now enter "SYSTEM" to exit AmigaBASIC.

The next step is to add the ability to enter arguments with the Bozo script command. The script file ".key" statement, placed at the beginning of the script file, allows this. It specifies the type and number of arguments which can or will be entered. For example, the ".key" statement:

```
.key a1,a2,a3,a4,a5,a6,a7,a8
```

specifies that up to eight optional arguments can be entered after the script name. When the script file is executed, AmigaDOS substitutes the arguments in the ".key" statement with the arguments (if any) in the command. This substitution is done on a first come first serve basis. For example, if a script file containing the above ".key" statement was executed with three arguments, those arguments would be substituted for the first three keywords (a1, a2, and a3) with the arguments maintaining their original order. Change the script file "Bozo" to be:

```
.key a1,a2,a3,a4,a5,a6,a7,a8
echo >RAM:test "<a1> <a2> <a3> <a4> <a5> <a6> <a7> <a8>"
AmigaBASIC ReadArgs
```

Notice there is a space between each "<a_>" sequence. The less than ("<") and greater than (">") symbols indicate the text they contain (which corresponds to a keyword in the ".key" statement) is to be replaced with an argument entered when the script file is executed. If there is no argument for that label, then the "<a_>" will replaced with nothing and only the intervening spaces will remain. After you save the file "Bozo", you might have to set the "script" bit again because some editors reset it. Once it's saved, from the CLI, enter:

```
    >Bozo Bozos buy rubber baby buggy bumpers
```

(for 1.2, enter "execute Bozo Bozos buy....")

When the script file executes, the arguments are inserted into the "echo" statement of a temporary copy of the script file:

```
echo >RAM:test "Bozos buy rubber baby buggy bumpers   "
```

the spaces after "bumpers" are the spaces between the a6, a7, and a8 parameters. When the ReadArgs program is run in AmigaBASIC, the lines:

```
    Arguments entered:
    Bozos buy rubber baby buggy bumpers
    OK
```

will appear. Exit AmigaBASIC and reenter the script command several times using different arguments.

As you can see, we can now pass any information to an AmigaBASIC program from the CLI. All we need to do now is have the AmigaBASIC program parse the input line into the individual arguments. I have written a general purpose subprogram to do just that. The subprogram GetArgs.MSB (listing - 1) reads a line from the specified file and separates the arguments using the space as a delimiter. The number of arguments found is returned in the variable "argc", and the arguments themselves are returned in the array argv$().

To use the subprogram in your own programs, you need to DIMension the argv$() array to accommodate the maximum possible arguments (determined by the .key statement in the script file) and specify the name of the temporary file containing the arguments. To see the program in action, first change the "ReadArgs" program to be:

```
DIM argv$(8)
CALL GetArgs.MSB( "RAM:test", argc, argv$() )
IF argc = 0 THEN
    PRINT "No arguments entered!"
ELSE
    PRINT "Arguments entered:"
    FOR x = 1 TO argc
        PRINT x; argv$(x)
    NEXT x
END IF
END
```

Combine the GetArgs.MSB subprogram with it. If you have the BASIC Linker program (published in AC V. 3.10), you can use it to link the files together. Once you've saved the program, enter from the CLI :

(continued)

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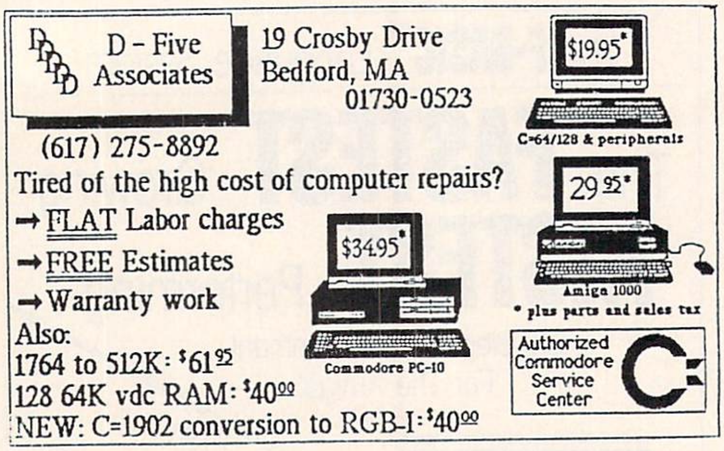
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```
>Bozo Bedtime for Bonzo was really about bozos
```

The results will be:

```
Arguments entered:
1  Bedtime
2  for
3  Bonzo
4  was
5  really
6  about
7  bozos
OK
```

Exit AmigaBASIC and then enter:

```
Bozo
```

The results will be:

```
No arguments entered!
OK
```

Then exit AmigaBASIC.

We are almost through running AmigaBASIC programs from the CLI. All we need to do is automatically return to the CLI (i.e., exit BASIC). Just add the statement "SYSTEM" to your program right before the "END" statement. This works fine and dandy with one exception. All the text output of the program goes to the AmigaBASIC window. When the "SYSTEM" statement is executed, that window will be closed! With some programs you may not want to see any text output, so the screen closing once the program has completed will not be a problem.

But when you need to see the information, there are two ways of getting around this problem. The simplest way is to add an "INPUT" or "SLEEP" statement before the "SYSTEM" statement or after reporting an error requiring a keyboard or mouse click input before the window is closed.

Another way is to use the same method that provided the program with the arguments from the CLI. Any information which needs to remain after the program exits can be placed into the temporary file using PRINT#'s (after the file has been "OPEN"ed for "OUTPUT"). The information could then be transferred from the temporary file to the CLI window with a "type" command in the script file. If we changed our "Bozo" script and "ReadArgs" program to use the file for output, they would look like this:

Script:

```
.key a1,a2,a3,a4,a5,a6,a7,a8
echo >RAM:test "<a1> <a2> <a3> <a4> <a5> <a6> <a7> <a8>"
AmigaBASIC ReadArgs
type RAM:test
```

Program:

```
DIM argv$(8)
CALL GetArgs.MSB( "RAM:test", argc, argv$() )
OPEN "RAM:test" FOR OUTPUT AS #1
IF argc = 0 THEN
    PRINT#1, "No arguments entered!"
ELSE
    PRINT#1, "Arguments entered:"
    FOR x = 1 TO argc
        PRINT#1, x; argv$(x)
    NEXT x
END IF
CLOSE 1
SYSTEM
END
```

Now when you enter the "Bozo" command, you will not see the results until AFTER the program has executed and AmigaBASIC has exited.

To demonstrate the practical use of passing arguments from CLI and using the GetArgs.MSB subprogram, I have written a simple utility Merge.MSB (listing two) which is similar in function to the AmigaDOS "join" command. The Merge.MSB program is invoked with the script file Merge (listing three). When both files have been saved to disk, remember to set the script bit in the Merge file.

To execute the Merge program, from the CLI enter "Merge" with the desired arguments. If you enter "Merge" by itself, you will get a standard format for the command. This is a common practice for commands requiring arguments to execute properly. Also note that if the required "AS" argument is not entered, the program will complain about it.

Being able to pass arguments to AmigaBASIC programs from the CLI opens many doors. Converting C programs to AmigaBASIC will be a little bit easier, and many existing AmigaBASIC programs can be enhanced by adding this technique. A whole class of programs that would have been impractical before can now be written in AmigaBASIC.

(GetArgs.MSB, Merge.MSB and the sample Merge script file are available on AC Disk #2)

Listing One
GetArgs.MSB

```
'---------------------------------------+
'                    GetArgs.MSB
'             Copyright 1989 by Brian Zupke
|
     This subprogram gets the first line of the specified input file
and seperates the line into its seperate arguments. The number of
arguments found is placed in "argc" and each argument is placed in the
"argv$" array in the order in which they are found. The first argument
is placed in "argv$(1)" and the last argument is placed in
"argv$(argc)". If the input line does not have any nonblank | '
```

```
characters, then "argc" is returned with a value of 0 and  "argv$" is
unchanged.  This subprogram assumes the specified file exists and does
no special error processing.

'
SUB GetArgs.MSB( FileName$, argc, argv$(1) ) STATIC
'
'  Open the specified file (assume it exists)
'  Get the first line (should be only line in file)
'  And then close the file
'
 OPEN FileName$ FOR INPUT AS #255
 LINE INPUT#255, ArgLine$
 CLOSE 255
'
'  Process argument line
'
 Argc = 0
 Char = 1
 ArgLen = LEN( ArgLine$ )
 WHILE Char <= ArgLen
  IF ( MID$( ArgLine$, Char, 1 ) = " " ) THEN
   Char = Char + 1
  ELSE
   argc = argc + 1
   x = 0
   WHILE( Char+x ) <= ArgLen AND MID$( ArgLine$,Char+x,1 ) <> " "
    NonBlank = x + 1
    x = x + 1
   WEND
   argv$( argc ) = MID$( ArgLine$, Char, NonBlank )
   Char = Char + NonBlank
  END IF
 WEND
END SUB
```

Listing Two
Merge.MSB BASIC Merge files utility

```
'------------------------------+
'                                                            |
'             BASIC Merge files utility                      |
'                                                            |
'           Copyright 1989 by Brian Zupke                    |
'                                                            |
'                                                            |
'      This program will merge several ASCII files into      |
'  one single file.  It is similar in function to the        |
'  AmigaDOS 'join' command, and also similar to the          |
'  AmigaBASIC 'MERGE' command.  It is primarily a            |
'  demonstration of utilizing argument passing from CLI.     |
'  This routine expects the file 'RAM:arg_temp' to exist.    |
'  That file should be created by a script/command file.     |
'  The script file should look something like this:          |
'                                                            |
'  .key a1,a2,a3,a4,a5,a6,..                                 |
'  echo >RAM:arg_temp "<a1> <a2> <a3> <a4> <a5> <a6> ..."    |
'  AmigaBASIC Merge.MSB        / If program is linked \      |
'  type RAM:arg_temp           | with BLINK, then use |      |
'                              \ 'Merge.MSB.EXE'      /      |
'                                                            |
'------------------------------+
'
'
  DIM argv$(20)        : Allow up to 20 arguments from CLI
  DIM SHARED NoError
'
' Global constants
'
  DIM SHARED TRUE    :   TRUE = -1
  DIM SHARED FALSE   :   FALSE = 0
'
' Trap I/O errors
'
  ON ERROR GOTO ProcessError
  NoError = TRUE

  PRINT "File Merge Utility"
'
'------------------------------+
'             Get Argument List                              |
'------------------------------+
'
  CALL GetArgs.MSB("RAM:arg_temp", argc, argv$() )
'
'------------------------------+
'            Open report file                                |
'------------------------------+
'
  OPEN "RAM:arg_temp" FOR OUTPUT AS #3
'
'------------------------------+
'       Check if no arguments were entered                   |
'------------------------------+
```

(continued)

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```
'
  IF ( argc = 0 ) THEN
'
' No arguments entered - print format and read arguments
'
    PRINT#3, " "
    PRINT#3, "FORMAT:  MERGE file <file ...> AS file"
    PRINT#3, " "
  ELSE
'
'-------------------------------+
'           Check if input format satisfied               |
'-------------------------------+
'
    IF ( argc < 3 OR UCASE$(argv$(argc-1)) <> "AS" ) THEN
      PRINT#3, " "
      PRINT#3, "You must specify keyword 'AS'!"
      PRINT#3, " "
      PRINT#3, "FORMAT:  MERGE file <file ...> AS file"
      PRINT#3, " "
    ELSE
'
'-------------------------------+
'   Make sure output file is not listed as input file     |
'-------------------------------+
'
      DuplicateFile = FALSE
      FOR x = 1 TO argc-2
        IF ( UCASE$(argv$(x)) = UCASE$(argv$(argc)) ) THEN
          DuplicateFile = TRUE
        END IF
      NEXT x
      IF ( DuplicateFile ) THEN
        PRINT#3, " "
        PRINT#3, "Output file: ";argv$(argc);
        PRINT#3, " specified as input file!"
        PRINT#3, " "
      ELSE
'
'-------------------------------+
'                Open output file                         |
'-------------------------------+
'
        OPEN argv$(argc) FOR OUTPUT AS #1
        IF ( NOT NoError ) THEN
          PRINT#3, "Can't open: ";argv$(argc)
          CLOSE 1
        ELSE
'
'-------------------------------+
'      Read each input file and write to output file      |
'-------------------------------+
'
          FOR NextArg = 1 TO argc-2
            OPEN argv$( NextArg ) FOR INPUT AS #2
            IF ( NOT NoError ) THEN
              PRINT#3, "Can't open file: ";argv$(NextArg);"."
              PRINT    "Can't open file: ";argv$(NextArg);"."
              NoError = TRUE
              CLOSE 2
            ELSE
              PRINT "Adding: ";argv$( NextArg );"."
              WHILE ( NoError AND ( NOT EOF(2) ) )
                LINE INPUT#2, SourceLine$
                PRINT#1, SourceLine$
              WEND
              CLOSE 2
            END IF
          NEXT NextArg
          PRINT#3, "File ";argv$(argc);" created."
'
'-------------------------------+
'              Close output file                          |
'-------------------------------+
'
          CLOSE 1
'-------------------------------+
'          End of open output file check                  |
'-------------------------------+
'
        END IF
'-------------------------------+
'          End of duplicate file check                    |
'-------------------------------+
'
      END IF
'-------------------------------+
'          End of format satisfied check                  |
'-------------------------------+
    END IF
'
'-------------------------------+
'            End of no arguments check                    |
'-------------------------------+
'
  END IF
'-------------------------------+
'              Close report file                          |
'-------------------------------+
'
  CLOSE 3
'-------------------------------+
'                Return to CLI                            |
'-------------------------------+
'
  SYSTEM
END
'-------------------------------+
'            Process I/O errors only.                     |
ProcessError:
  IF ( ERR = 53 OR ERR = 61 OR ERR = 64 OR ERR = 68 OR ERR = 70 ) THEN
    NoError = FALSE
    IF ( ERR = 70 ) THEN
      PRINT#3, "Disk write-protected!"
    ELSEIF ( ERR = 61 ) THEN
      PRINT#3, "Disk FULL!"
    END IF
    RESUME NEXT
  ELSE
    ON ERROR GOTO 0
  END IF
```

Listing Three
BASIC Merge script file

```
.key  a1,a2,a3,a4,a5,a6,a7,a8,a9,a10,a11,a12,a13,a14,a15,a16,a17,a18,a19,a20
echo >RAM:arg_temp "<a1> <a2> <a3> <a4> <a5> <a6> <a7> <a8> <a9> <a10> <a11> <a12> <a13> <a14> <a15> <a16> <a17> <a18> <a19> <a20>"
AmigaBASIC  msb:merge/merge.msb.exe
type RAM:arg_temp
```

•AC•

MENACE

by: Jeffery Scott Hall

Menace, from Psygnosis Software, is being marketed and released under Psygnosis' new affiliated label, Psyclapse. This new label represents high arcade quality games, made available at a lower price. Menace is their first arcade "shoot 'em up"-style game, with many more to follow in the footsteps of its release.

After the game has loaded, a title screen will be displayed while a stereo sound track plays in the background. Before you begin the game, you may select one of two different skill levels: normal or expert. Once you have made your choice, game play will begin.

Your Orders:
Destry the Planet Draconia

You have been recruited to pilot a spaceship to the planet Draconia, and destroy anything threatening to stand in your way. The reason for this destruction is that the aliens inhabiting this planet have destroyed billions to build one tremendous, super planet that is capable of destroying the entire galaxy. The aliens have given this planet the code name Draconia. If Draconia is not destroyed, then trillions of life forms are doomed!

Once game play has begun, you will find your ship's status indicators located at the bottom of the screen. Here, along with your score, will be the ship's shield, cannon, and laser indicators showing their current status. Your ship will always be located on the left hand side of the screen, as you pilot your way towards the right.

As your ship glides along, you will notice the background scrolls horizontally with perhaps the best visual effects I've seen on a "shoot 'em up"-type game. One reason for this effect is that the entire game is displayed in overscan mode. This eliminates any borders and provides the player with true arcade quality playing.

You will start out at Level One, as the mother ship delivers you close to the planet Draconia. You will quickly notice that action is very intense as wave after alien-packed wave tries to keep you from completing your mission. As you progress through the game, you will encounter over 60 different aliens, each possessing powers deadly to your ship's defenses. In order to destroy the aliens, your ship is provided with a lower power laser. Some aliens can be destroyed with the laser after several hits, while others are impossible to destroy without more firepower.

If you choose, you can navigate through some of the aliens. However, any contact made between the aliens and your ship will result in your shield power being reduced. Also, on the more advanced levels you will find that some aliens are equipped with heavy firepower, which makes game play even more difficult. So, in order to have a fighting chance, you will be rewarded for destroying all aliens within a certain wave.

Bonus Power

After all aliens have been destroyed, a bonus icon will appear in the position of the last alien, and it will begin to approach your ship. You will be rewarded with whatever value this icon represents. You may shoot the icon five times, which will result in one of the following: 1000 bonus points, laser cannons, long-range lasers, increase in your ship's speed, outrider being attached to your ship, force field, or shield regeneration. Whenever you fly over one of these bonus items, it will automatically be engaged.

That's One Tough Mother Alien!

Menace contains six complex levels, each more difficult than the last. In order to advance to the next level, you must first destroy the mother alien who waits for you at the end of each round. Each of the mother aliens you encounter will be much tougher than any alien you might have faced during that level of play. To destroy the mother alien, you will have to shoot it many times. You will need extremely fast reflexes to dodge the mother alien's devestating onslaught.

Saying Goodbye to Draconia

Game play will end when you have either destroyed the entire planet of Draconia, or you have used up all your ship's shield power. If you have been killed, you will be given the option of restarting the game on the same level on which you were destroyed. However, when this happens you will loose all other increased firepower which you might have added to your ship, not to mention your score. Oh well, you can't win them all!

Summary

Menace is perhaps one of the best games ever released from Psygnosis Software. The manual included with the game explains all the bonus items and their functions, along with other important information about the game. During game play you will use the following options: pause game play; toggle sound effects off/on; toggle music off/on; and abort game play, which takes you back to the title screen. Menace combines great sound effects, graphics, music, and visual effects for what is certain to be a hit with all the arcade addicts out there!

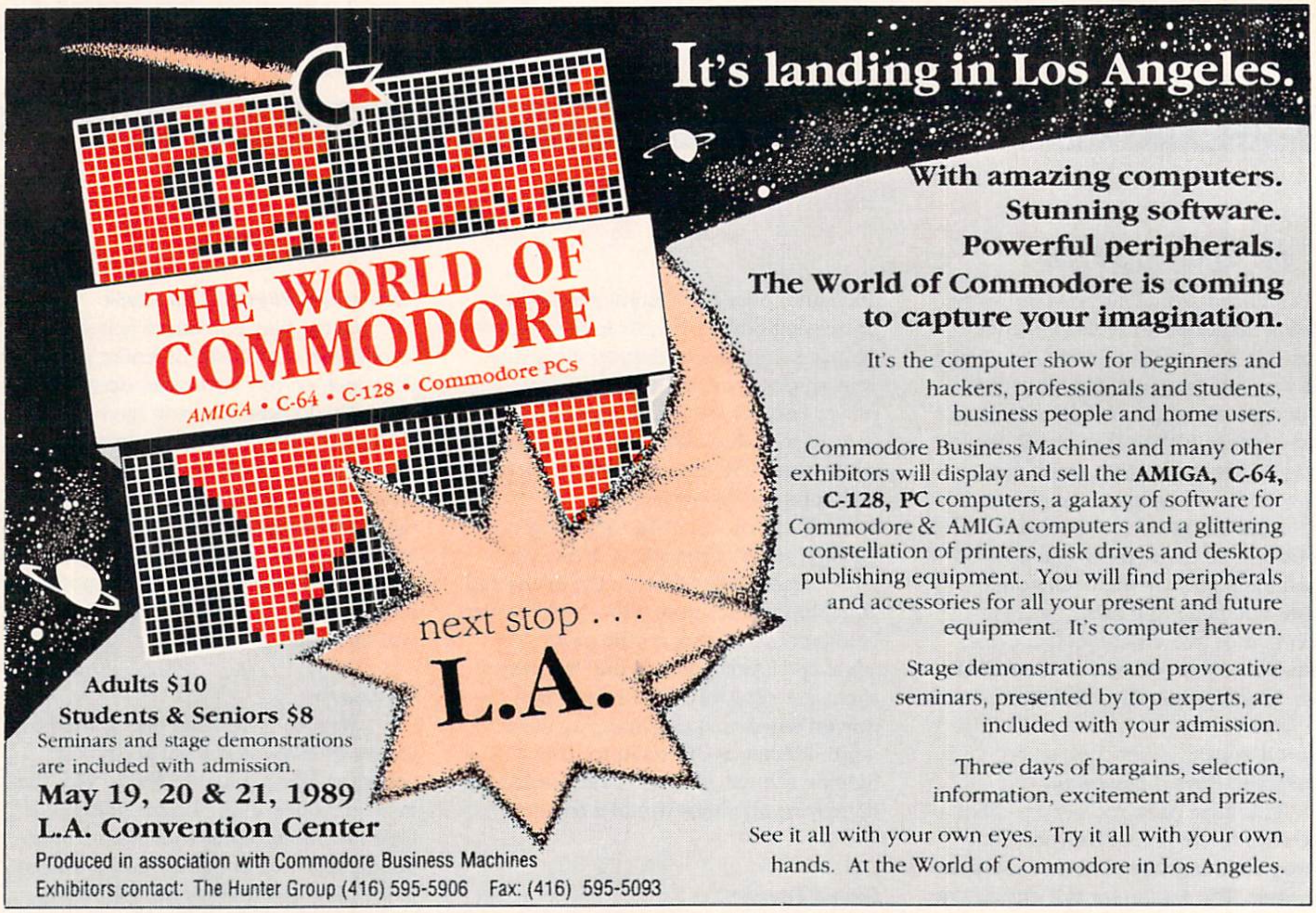
Hints and Tips

Whenever possible, try to shoot all the aliens in the current wave for a bonus icon. Once the icon appears, start shooting at it until you have managed to get either the cannons or lasers. You will definitely need one of these weapons in order to survive the end of each level with the mother alien.

If your shields are weak, you may avoid some of the aliens by flying around them. To do this, simply select a spot on the screen where the aliens are not concentrated (most likely towards the bottom), and fly right past them. While this is not the best way to score, you will be able to progress further through the game.

Be sure to avoid using the force field when you are between alien waves. This will give you more time for protection against the aliens' attack.

•AC•



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Creating Shared Libraries

by John Baez

Why Shared Libraries?

One of the most powerful features of the Amiga's operating system is the ability to use general purpose functions stored in special programs called libraries. The advantage of these shared libraries, as they are called, is that one copy serves as many programs as necessary, and almost every programming language on the Amiga has some way of using them.

In a complex environment such as that of the Amiga, libraries provide a means for accessing even the most complex facilities in a straightforward manner. A clear example of the power of libraries is demonstrated in the Amiga's standard libraries. These libraries make it possible to access all of the Amiga's features without having to worry about the details of the functions. (Imagine what a routine that moves a window over the workbench screen without erasing any icons is like!)

Standard routines like IFF functions should be placed in libraries so any Amiga programmer can access them. Right? Right! So how come we hardly ever see general purpose functions implemented as shared libraries? I found the answer to this question when I set out to create a library for my own use.

Anyone who tries to create a shared library immediately runs into two problems. The first problem is a lack of documentation. Reading the RKM and studying its examples is like reading German and trying to interpret it as Spanish. The second problem is that some knowledge of 68000 assembler is required. Most programmers end up taking the easy way out by creating a link library (for use with alink or blink) which can only be accessed by a limited number of languages.

I'd like to take some of the mystery out of creating shared libraries in the hope that more programmers will create them. This is the best way to provide general usage functions across the broadest number of Amiga programming languages (and Amiga programmers). This applies to casual programmers as well as professional developers. Making powerful facilities available to the Amiga community is a great way to enhance overall productivity. Shared libraries can go a long way in accomplishing this.

The Structure and use of a Shared Library

An Amiga shared library is a very simple structure once loaded into RAM. It consists of some basic information such as how many tasks are currently using it and a table of the addresses of the functions which make it up, as shown in figure one.

Whenever a program wishes to use one of the library's functions, it just gets that function's address from the library's address table and jumps to that address. All it must know is the table's location and which addresses in the table correspond to the desired function.

If you look at the library structure in figure one, you'll notice that the function addresses are located in reverse order above what is called the library base address. (The first function is closest to the library base.) The library base address is the address table location, as well as the point where the library's basic information starts. Therefore table entries are lower (negative) than the library base address. Library information is higher (positive) than the library base address.

Each entry in the function address table has a length of 6 bytes. Therefore, the first function of the library is located at library base -6, the second is at library base -12, etc. The (-6) is called the library offset.

If we use our newly learned terminology we can say that in order for a program to access a library function, it must know the library base and the library offset for the desired function.

Each particular language has its way of obtaining this information. The programmer doesn't require the library offsets in order to access library functions.

In AmigaBASIC, for example, the programmer only needs to make sure that the '.bmap' file(s) for the library(s) he is going to use are in an accessible directory. The '.bmap' file, as we will see later, contains the library offset for each function of a particular library. This is how BASIC knows where the library functions are.

(continued)

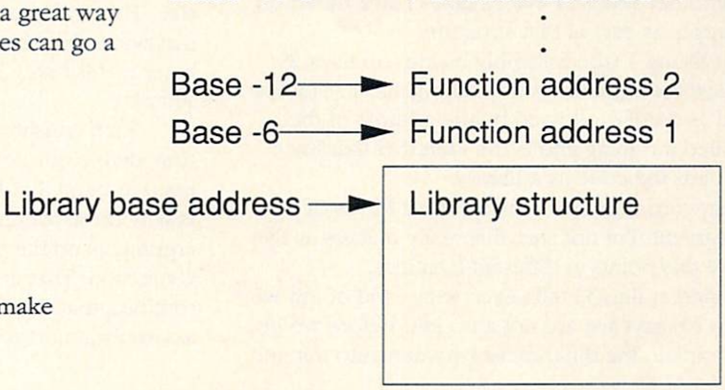

Figure One
Shared Library Structure

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In order to get the library base address, AmigaBASIC makes use of the Amiga library function OpenLibrary(). This function returns the library base.

Creating a Shared Library

Now that we understand the mechanics of shared libraries, let's see how we go about creating one.

A shared library looks like a regular program to AmigaDOS. It can be loaded and executed just like a program. And it is created just like a program. (Well, almost.) What makes a library distinct is that it must have a particular structure. This structure (a pattern) is searched for by Exec when the library is loaded into memory with an OpenLibrary() request. If it isn't found Exec unloads the code and OpenLibrary() returns a zero. If it is found then another series of events takes place based on information you supply as part of that structure.

If you look at listing 1 (the assembly listing) on lines 29 through 38, you'll see the structure we're talking about. The first 2 bytes are defined as $4AFC followed by the address of their location. This is called a romtag and is the identifier that Exec looks for when it loads the code as a library.

The next long word (line 31) contains the address of the end of this code segment. I'm not sure this really matters as I've seen libraries where this points at different locations.

The byte defined at line 32 tells Exec what kind of init we are. A value of zero (0) says we are not auto init. Before we go any further let me explain the differences between auto init and us (self init?).

When auto init is requested, Exec makes a call to MakeLibrary() which allocates storage and creates our library base. In this case we would not be required to define and initialize our library as we do in lines 49 to 83. MakeLibrary() would do this for us. We would have to supply a list of function addresses and an initialization block. We would not be required to call AddLibrary (as we do at initialization) . This is the way the RKM example illustrates.

There are two reasons why I don't use auto init. Using auto init has execution overhead (nothing significant). It also uses more storage since it requires the definition of an init block and duplicates the function addresses. Neither of these issues are powerful enough to justify not using auto init, but the small savings in space justifies not using it for me.

The next 2 bytes (lines 33, 34) represent the version (1) and the type (library=9) of romtag that we are (we could have been a device!).

The next byte (line 35) is the priority(0) followed by a pointer to the library name and a pointer to the library id string.

Last (line 38) is a pointer to the initialization routine which will be run when our library is first loaded. If we had been auto init, then this location would have pointed to an initialization block instead.

Our library is defined in lines 49 to 83. The first thing we see is the function address table (jump vector) in lines 49-64. As mentioned earlier, each entry uses 6 bytes and the functions are listed in reverse order. Note that the functions closest to the library base (which is at line 69) are documented as system support functions. We'll be looking at each of these to see what they do, in a moment. The fifth entry from the base is our first function (library offset=-30). Our sample library has only two functions.

The first two bytes of each entry represent a machine language jump to a long address (The assembler I used wouldn't generate the right code for 'jmp.l' so I hard coded it in hex). The following 4 bytes contain the address of the machine language portion of our function.

Following the jump vector is the library structure. This consists of an Exec node structure followed by 20 bytes of library info. Lines 70-73 initialize the node.

Line 74 initializes the library flags. Our initialization says that we require check sum checking and that we need the check sum to be calculated. The best explanation of these flags that I have seen is on page 152 of Sybex's Amiga Programmer's handbook .

Line 76 indicates the size of our jump vector in bytes. We have 6 entries at 6 bytes each. The next word represents data size. This includes the library structure (34 bytes) plus any data that we define. In this case we are using one long word (4 bytes). This totals 38 plus two bytes I added for psychological security.

That constitutes the data portion of our library. We must now define our library routines. In order to do this we must keep in mind that Exec passes us information in registers. That is why these routines are in assembly. Once we place the arguments on the stack (where C expects them), we can call the C function. That is basically all these routines do (the assembly routines, that is) and that is why creating a library requires some assembly language.

The assembly routines are simple, straightforward and documented on the listing itself. You shouldn't have to change them for anything. Note that in the call to the C functions, the function name is preceeded with an underscore. That is the way C generates the function name internally, so all assembly references to C functions (and names) should be preceeded by an underscore.

The important point in the assembly routines is the placement of registers on the stack. This is done with the 'movem.l' instruction you see prior to each 'jsr' to C. It is important to note that the registers are loaded on the stack starting from A7 to A0 and D7 to D0. This means that you must assign registers to your arguments in that same order. If your function uses 4 arguments, for example, you could assign registers D0 through D3 to arguments 1 to 4 respectively. You couldn't, however, do it backwards or assign a random set of registers such as D0, A0, D1, A1. If you have doubts, you may use the 'move.l rr,-(sp)' instruction to place one register at a time on the stack.

The C functions should look pretty familiar. You can modify them as indicated in the source listing. You may open other libraries, call other functions and do anything you need. Be aware that you are coding functions which may be used simultaneously by various processes. Therefore, be careful not to code anything which will mess up by reentry. In particular be careful about using static variables.

Assembling, Compiling, and Linking

Once you've created your library source, proceed as follows:

```
asm slibh.a -rmr -nl
lc1 -b0 -cemsw slib
lc2 -r0 -v -sc=text -sd=text slib
blink slibh.o+slib.o to slib.library
lib lib:lc.lib+lib:amiga.lib SC SD ND
```

The assembler used is Wesley Howe's asm68k which is in PD (I couldn't get the lattice assembler to work properly and their scarce documentation didn't help much so I dumped it). Once you've linked your library, you should copy it to your LIBS: directory before doing any tests.

Gaining Access to Your Library

Once your library has been created, you'll need to provide the means for external programs to access it. As we mentioned earlier, different languages have different ways of doing this. Instead of trying to access it from one or two places, we'll use the method provided by Commodore to provide the required information to whoever needs it.

Commodore has provided a file format which describes shared libraries so that anyone interested could read the file and obtain the required library offsets. This format, commonly known as the '.fd' format, can usually be converted to the format required by different languages via conversion utilities. We'll see a few examples of this later. Let us take a look into the fd file required to access our sample library.

Listing 3 shows what the sample fd file looks like. The first line identifies the name of the library base. In this case it is named _Slib. The second line contains the starting offset of our

(continued)

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functions. Since our first function is the fifth one in the library's jump vector, we use a 30 (5 times 6 bytes per entry).

As long as you use the library structure as we've defined it, the first three lines of your fd file will always be the same except for the name of the library base. These are followed by the function definitions in their proper order.

Each function definition has the function prototype in C format followed by the registers in which the arguments are passed between parenthesis. You may use registers D0-D7 and A0-A3 to pass arguments in relative safety (this applies to Lattice C users only). Make sure your registers correspond with those placed on the stack on the call to C from assembly.

Once you've created your fd file and saved it (usually as 'libname.fd'), you can then use your language's conversion utility to create whatever your language requires. In AmigaBASIC, for example, you run the convertFD program and it will create the required '.bmap' file. For Lattice C you run FD2PRAGMA and it will create the appropriate #pragma header file. Listing 5 shows the #pragma statements generated for our sample library.

A note on #pragma. The current implementation of libcall limits functions to 4 arguments (they don't mention this in the manual). I don't know why Lattice did this (it ruins an otherwise great feature). Until the limitation is removed keep this in mind if you're designing functions for use by Lattice C.

Some languages (Lattice & MANX C and Modula 2, for example) use stub libraries which they link to at run time. The stub functions are small assembly routines which have the library offset hardcoded into them. They use it to perform a jump to the appropriate location from the library base. An example of stub functions for our sample library is included in listing 4.

After you've done your fd conversion, then you just proceed as you do with any other library. Listings 5 and 6 illustrate this for AmigaBASIC and C using our sample library.

Step by Step Review

Let us go over the complete process step by step. Once you've entered listings 1 and 2 and you're ready to create your own library, proceed as follows:

1. Modify the assembly program jump vector (lines 51-54) to include your functions
2. Adjust the jump vector size (line 77) accordingly
3. Add the appropriate XREF(s) at lines 18-19
4. Modify lines 40-41 with your library info
5. Copy one of the routines in lines 159-169 and modify the movem.l instruction to include the appropriate registers. Do this for each function you're adding to the library
6. Add your C function to the C source
7. If required modify the C source initialization, open, close and expunge routines to accomodate any special needs your library may have (optional)
8. Assemble, compile and link your library
9. Place your library in the LIBS: directory
10. Create an '.fd' file for your library
11. Convert your '.fd' file for the language you use
12. Test your library

Thats it! The shared library mystery solved (I hope!). Once you get the hang of it you'll be moving all your general purpose routines into shared libraries. Don't forget, if you have anything you think is worth sharing, share it! That's why many people call them shared libraries!

Listing One
slibh.a

```
*
*   slibh.a - shared library assembly header
*

      SECTION text
      XDEF          _LibraryName,_LibraryId,_SysBase

* library support C functions accessed from assembly

      XREF          _CInit
      XREF          _LibOpen
      XREF          _LibClose
      XREF          _LibExpunge
      XREF          _LibReserved

* user C functions access from assembly

      XREF          _Func0
      XREF          _Func1

Start:clr.l         d0                    ; if we are executed as a
program instead
      rts                   ; of opened as a library we return 0

*  romtag structure - when loaded as a library Exec looks for this
*  (identified by $4AFC followed by an address pointing to it)
*  somewhere at the beginning of our load point.
*  This tells exec how to get us going as a library.

InitDesc:   dc.w    $4AFC     ;romtag stuff
         dc.l    InitDesc
         dc.l    EndCode     ;???????
         dc.b    0           ;no auto init
         dc.b    1           ;version
         dc.b    9           ;NT_LIBRARY
         dc.b    0           ;priority
         dc.l    _LibraryName
         dc.l    _LibraryId
         dc.l    Init        ;routine to be executed for initializa-
tion

_LibraryName        dc.b      'sample.library',0
_LibraryIddc.b      'sample library 1.0 (01 Sep 1988)',13,10,0

      ds.w          0

* our function list (also known as the jump vector)
* since we are not auto init this must be set up exactly as MakeLi-
brary()
* would set it up.

Funcs:
*     user functions go first
      dc.w          $4EF9           ;long jump
      dc.l          AFunc1          ;offset=36 ($24)
      dc.w          $4EF9
      dc.l          AFunc0          ;offset=30 ($1e)

*     system functions go second (always in this order)
      dc.w          $4EF9
      dc.l          ALibReserved
      dc.w          $4EF9
      dc.l          ALibExpunge
      dc.w          $4EF9
      dc.l          ALibClose
      dc.w          $4EF9
      dc.l          ALibOpen

* the library structure must immediately follow the function list
* it must be initialized since we're not auto init.

lib:  dc.l          0                        ;ln_Succ    ;node pointer
      dc.l          0                        ;ln_Pred    ; "       "
      dc.b          9                        ;ln_Type    ;node
type(NT_LIBRARY)
      dc.b          0                        ;ln_Pri     ;priority
      dc.l          _LibraryName             ;ln_Name    ;node name

      dc.b          6                        ;LIBF_CHANGED|LIBF_SUMUSED
      dc.b          0
      dc.w          36                      ;jump vector size
      dc.w          40                      ;data size
      dc.w          1                       ;version
      dc.w          0                       ;revision
      dc.l          _LibraryId;library id
      dc.l          0                       ;check sum (provided by
AddLibrary on Init)
      dc.w          0                       ;open count

*     user data can be placed here.
*     If your using C this isn't necessary so what I do is define
*     variables which I may need in my assembly code.

_seglist dc.l       0

* initialization routine. This routine is called when the library is
* first loaded. Therefore it is executed only once.
* Exec gives you the load point of your program (the segment list)
* in A0.
* Since we aren't auto init we must know were our library structure is
* located. In this case it is located at lib (which we load into a1).
* We then call our C initializer which does any initialization you
* for your particular library. The only requirement of the C routine as
* of now is that it perform the AddLibrary() function.

Init:
      move.l        a6,_SysBase ;sysbase
      move.l        a0,_seglist ;save segment list
      lea lib,a1
      move.l        a1,-(sp)
      jsr _CInit
      addq.l        #4,sp
      rts

* Each time someone issues an OpenLibrary() to us this routine gets
* control. The only thing we do here is set up the stack for our C
* routine. Our C routine increments the open count and can perform
* anything else you may require for your particular library.

ALibOpen:
      move.l        d0,-(sp)      ;version
      move.l        a6,-(sp)      ;library base
      jsr _LibOpen
      addq.l        #8,sp
      rts

* When someone issues a CloseLibrary() to us this routine gets control.
* Here (again) we just set up the stack and call our C routine. It
* should take care of anything that must be done when a user task no
longer
* needs to the library's functions.

ALibClose:
      move.l        a6,-(sp)
      jsr _LibClose
      addq.l        #4,sp
      rts

* when no one is using the library any longer (when all user tasks that
* issued OpenLibrary() have issued a corresponding CloseLibrary()) this
* routine takes care of cleaning up and unloading the library.
* Here (again) we just set up the stack and call our C routine.

ALibExpunge:
      move.l        a6,-(sp)
      jsr _LibExpunge
      addq.l        #4,sp
      rts

* At this moment this function does nothing!

ALibReserved:
      clr.l         d0
      rts

* all of our user functions require the following code to set up the
* stack for our C routines. When any of these routines are called the
* arguments they pass are in registers (Amiga standard). We must move
* them to the stack which is were C functions get their arguments from.
* Upon return we must adjust the stack by 4 for each argument.
* Remember: arguments must be placed on the stack from right to left.
*         That is:  Func0(d0,d1);
*               is passed as d1/d0,-(sp) (backwards)

AFunc0:
      movem.l  d1/d0,-(sp)    ;pass parms
      jsr _Func0
      addq.l        #8,sp
      rts

AFunc1:
      movem.l  d1/d0,-(sp)    ;pass parms
      jsr _Func1
      addq.l        #8,sp
      rts
EndCode:
```

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```
* Lattice C is fuzzy about not having its own startup code.
* I found out how to calm it down a little by including all this
* special stuff. If you don't include this it'll crack up when
* you try linking your code.

* nasty comment: I like the way MANX handles this better.
* If your using MANX you can get rid of all this stuff and define
_SysBase
* in the user data area above. Actually I think MANX takes care if this
* type of request better than Lattice (give credit where credit is
due!).
* For Lattice, blink gives you a warning about this section. Just ignore
it.

      SECTION __MERGED

      xdef          __oserr,__OSERR,__FPERR,__SIGFPE
      xdef          __SIGINT,__ONERR,__ONEXIT,__ONBREAK,__ECS
      xdef          __ProgramName

_SysBase      dc.l  0
__oserr:
__OSERR       dc.l  0
__FPERR       dc.l  0
__SIGFPE      dc.l  0
__SIGINT      dc.l  0
__ONERR       dc.l  0
__ONEXIT      dc.l  0
__ONBREAK     dc.l  0
__ECS       dc.l  0
__ProgramName dc.l  0

      END
```

(continued)

Listing Two
slib.c

```
#include  <exec/types.h>
#include  <exec/libraries.h>
#include  <libraries/dos.h>

/* the following structure helps you access data that is part of
   the library better. Just make sure you keep it in sync with
   the assembly code.
*/

struct ExtLibrary
{  struct Library lib;

/* user datanames go here */
/* in this case all we have is one variable */

   long seglist;
};

#define el lib->lib /* convenience */

struct ExtLibrary *CInit(lib)
struct ExtLibrary *lib;
{
/* if you need to do any special one time things like openning other
   libraries or setting up any internal data structures this is the
   place to do it. */

   AddLibrary(lib); /* since we’re not auto init we have to add
ourselves */
   return(lib);
}

struct ExtLibrary *LibOpen(lib,version)
struct ExtLibrary *lib;
long version;
{
  ++el.lib_OpenCnt;
   el.lib_Flags &=~LIBF_DELEXP;

/* if you need to do anything special each time someone opens you
   (the library!) this is where you do it. */

   return(lib);
}

LibClose(lib)
struct ExtLibrary *lib;
{
/* if you need to do anything special each time someone closes you
   this is where you do it. */

   if(lib->lib.lib_OpenCnt)
   {  -lib->lib.lib_OpenCnt;
      return(NULL);
   }
   if(lib->lib.lib_Flags & LIBF_DELEXP)
      return(LibExpunge(lib));
   return(NULL);
}

LibExpunge(lib)
struct ExtLibrary *lib;
{  long seg;
   if(lib->lib.lib_OpenCnt)
   {  lib->lib.lib_Flags |= LIBF_DELEXP;
      return(NULL);
   }

/* this is goodbye time! make sure you clean up after yourself before
   your library is terminated! do all that here before its too late.
*/
   seg=lib->seglist;
   Remove(lib);
   return(seg);
}
/* and now the good stuff! This is were you put all those neat functions
   which you’ve always wanted to use from any language.
   A few pointers:
    -be consistent in the way you pass arguments. Remember that each
     arg requires a register in the assembly counterpart. Make sure
     you save any registers other than A0,A1,D0,D1 that you may use.
     Never use A5 or A7. If you have global variables declared in your
     C code you shouldn’t use A4.
    -be carefull about declaring static data inside your functions.
     As a library you may be used by various tasks simultaneously.
     This may cause static values to get messed up.
    -library functions should do general purpose things. If it can’t
     be shared by other tasks its usually not worth placing in a
library.

*/

Func0(a,b)
long a, b;
{
   return(a*b);
}

Func1(a,b)
long a,b;
{
   return(a+b);
}
```

Listing Three
sample .fd file

```
##base _Slib
##bias 30
##public
Func0(p1,p2)(D0/D1)
Func1(p1,p2)(D0/D1)
##end
```

Listing Four
slibstubs.a

```
          ;          Slib


          XREF   _Slib
          XDEF   _Func0
          XDEF   _Func1

_Func0:     move.l   _Slib,A0
          jmp      -30(A0)

_Func1:     move.l   _Slib,A0
          jmp      -36(A0)
```

Listing Five
slibtest.bas

```
LIBRARY 'slib.library'

DECLARE FUNCTION Func0&() LIBRARY
DECLARE FUNCTION Func1&() LIBRARY

PRINT “Func0() multiply 5x5=”;Func0&(5,5)
PRINT “Func1() add 5+5=”;Func1&(5,5)

PRINT “test completed.”
```

Listing Six
slibtest.c

```
/* the following #pragma statements are one of the great features
   of Lattice C. Here they are defined in the program as an example.
   In real life libraries they should be placed in a separate
   header file. This method avoids your having to create a separate
   stub library with base offsets and parameter info.

   The pragma statements can be created using the FD2PRAGMA program
   provided by Lattice.

   Lattice C V4 required.
   (you MANX guys will have to create the stub routines. See example)

*/

#pragma libcall Slib Func0 1e 1002
#pragma libcall Slib Func1 24 1002

long Slib; /* this guy should always be global */

main()
{  int i;
   puts(“openning...”);
    Slib=OpenLibrary(“sample.library”,0);
   printf(“\nSlib=%x”,Slib);
   if(!Slib)
   {  printf(“\ncouldn’t open sample library!\n”);
      exit(0);
   }
   printf(“\nfunc0=%d”,Func0(5,5));     /* multiply */
   printf(“\nfunc1=%d\n”,Func1(5,5));  /* add      */
   CloseLibrary(Slib);
}
```

•AC•

MultiSort

Sorting and Intertask Communication in Modula-2

by Steve Faiwiszewski

If you've been around computers long enough, you have inevitably come across the concept of sorting. Sorting is the act of organizing data in some determined order. This is usually done so the data can be accessed in a quick and efficient manner. An example of sorted data is a phone book; the data (names, addresses and phone numbers) is sorted in alphabetical order by last name. In computerese, we say the last name is the sort key.

There are many methods of sorting data, some better than others. A large part of computer science literature is dedicated to analyzing the various sorting algorithms. The trouble with this approach is, while the sort algorithm is described mathematically and precisely, most people have difficulty visualizing, and completely grasping, the sorting process itself.

I hereby present a program, called MultiSort, which graphically illustrates a few of the more popular sorting techniques. The program is educational in more ways than one. Aside from visualizing sorting, it also demonstrates the power and ease of using multi-tasking on the Amiga.

Using MultiSort

MultiSort opens a hi-res interlace screen and four windows, one for each sort that will be used. Data is represented in each window as a pixel plotted for every element of an array of numbers. The pixel's x coordinate is the array element number, while the y coordinate is the element's value. For example, if the second element in the array has the value of 21, then its corresponding pixel will be plotted at coordinates (2,21). The origin (0,0) is at the upper left corner of each window. Therefore, a sorted array with no two elements having the same value will be represented as a diagonal line drawn from the upper left corner to the bottom right corner.

Upon startup, the array to be sorted will contain random data, with no two elements having the same value. I call this uniquely random data to distinguish it from simple random data, in which two elements of the array may contain the same value. When the unique random data is sorted, a straight diagonal line will be displayed.

Data organization can be specified through the "Data" menu item. The following choices are available:

- ***Ascending***
  The array will be presorted in ascending order. Each element's value will be the element's number. For example, the third element will have the value of 3. The data will be displayed as a straight diagonal line from the upper left corner to the bottom right corner.

- ***Descending***
  Similar to the ascending option, only the array will be sorted in reverse order. The displayed data will be a diagonal line from the bottom left corner to the upper right corner.

- ***Random***
  The array will contain random data. More than one element may have a specific value.

- ***Unique Random***
  The array will contain unique random data, as mentioned above.

- ***Customized***
  You can enter the data manually. Choosing this option will open a data entry window. Simply click in that window and draw your data in. When done, click on the window's close gadget and your customized data will be copied into all the windows.

Sorting may be initiated through the "Start" menu item. While sorting is under way, the menu will provide a "Stop" option. Currently, only the Bubble sort will require the stop request. I felt that since the other sorts were fast enough, it was not necessary to slow them down by having them check the menu requests. Since the Bubble sort is extremely slow, it was the only one that merited the stop capability.

(continued)

Once the sort is completed, each window's title will display the corresponding sort's place on the finish line. Three asterisks mean that a stop was requested before that sort was done.

MultiSort is most useful for comparing various sorts side by side. However, you may at times want to use only one sort on a larger array. This is provided through the Zoom menu. Through zooming you can observe one of the selected sorts on a larger array (and larger window).

How it Works

When executed, the main process begins by setting up a few things, such as opening an Intuition screen, and opening windows - one per sort. The last part of setting up is the creation of sub-tasks, one for each sort. It then loops, waiting for menu selections.

Multiple Windows with One IDCMP Port

Usually, when an Intuition window is opened, Intuition allocates for it a message port known as the IDCMP port, through which it communicates various Intuition-related messages.

Since all the windows should display the same menu, and all are monitored by the same program, it is not necessary to let Intuition create a separate IDCMP port for every window. The program makes sure that only one port is created, by allocating one itself and by forcing Intuition to NOT create an IDCMP message port. This is done by setting up the IDCMPFlags field to null. Once the window is opened, its UserPort pointer is pointed to the allocated port, and the proper IDCMPFlags are set via a call to ModifyIDCMP.

Closing windows that share the same port requires the reverse of the above procedure. First, all pending Intuition messages must be removed from the port (or else some adverse things can happen). Then the window's UserPort must be sent to NIL, as well as to the IDCMPFlags field. Only then can CloseWindow be called.

Task Creation

The parent task creates sub-tasks with a call to CreateTask. The parameters to CreateTask are: new task's name, the created task's priority, the address of the code the created task is to execute, and the size of the task's stack.

The sub-task's local variables are allocated on its own stack space, so make sure the stack is large enough to accommodate all local variables, as well as anything that may get pushed onto the stack during procedure calls (i.e. return addresses, and the called procedures' local variables) or during a context switch (when the system switches to another task it pushes all the CPU's register on the stack).

Reentrancy and Multitasking

Naturally, the sub-tasks can freely modify their own local variables, but they can also access the program's global variables. Modifying global data is a tricky chore with multitasking. Therefore, it should either be eliminated or done in a restricted, well understood manner. This is necessary because all the sub-tasks execute the same code and, as such, should not change any data that might accidentally affect each other. This ability to execute the same piece of code by different tasks, without adverse effects, is called reentrancy, and it is an important concept in multitasking operating systems.

In MultiSort, the only global variable that may be changed by the sub-tasks is GlobalCount. Whenever a task is about to change GlobalCount, it issues a "Forbid" which disables execution of all other tasks until a "Permit" is issued. This prevents any problem of concurrent access to GlobalCount.

Signals for Intertask Communication

The parent task sends instructions to the sort sub-tasks, and waits for a response from them. In a previous article, I described intertask communication using messages and ports, but those are not employed in MultiSort; instead, only signals are used. The RKM defines a signal as an "event indicator". This is the basic mechanism used for all intertask communication. The message system, in reality, uses signals to notify tasks of the arrival of new messages.

A task may define up to 32 different signals, 16 of which are reserved for system use (leaving 16 user signals). These signals are represented as bits. They are independent of each other, and may be used concurrently. A signal is relative to the task that defined it. Any task wishing to signal a target task must use a signal that was defined by the target task.

A signal is defined using the AllocSignal routine, which returns the allocated signal bit number. A specific signal can be allocated by passing its number to AllocSignal, or -1 can be passed, to let the system allocate the next available signal. Before this signal can be used in any signal related routines, it must be converted into a bit mask. In C, that would be done with the shift operator (<<), but in Modula-2 that is done by INCLuding it in a bitset, as follows (using Benchmark):

```
VAR
     SigBitNum : SignalRange;
     SigMask   : SignalSet;
BEGIN
     SigBitNum := AllocSignal(AnySignal);
     INCL(SigMask,CARDINAL(SigBitNum);
```

Signalling a task is done through a call to Signal, which accepts to argument: a pointer to the target task, and a signal mask containing the signal bit that was previously allocated by the target task.

Sorts

I've included modules for the following sorts: Bubble, Quick, Shell, and Heap. These are probably the most widely known sorts. I've extracted the implementations from various sources, and modified them in only two ways. First, whenever an element of the array changes in value, a call is made to UpdateDisplay. Second, where some implementations assumed that arrays are 1 relative (i.e. the first element has an offset of 1), some additional (but trivial) changes were introduced to handle the fact that Modula's open arrays are 0 relative.

Program Modules

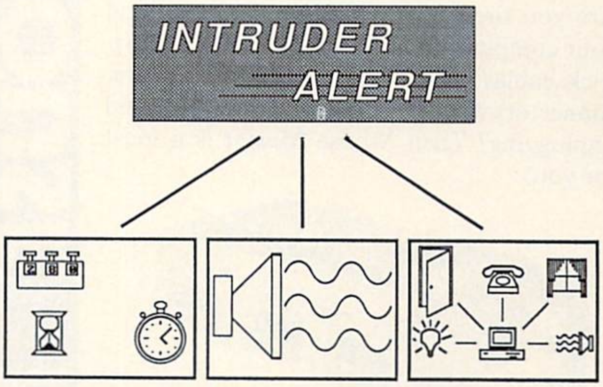
Aside from the four sort modules, the program consists of the following modules:

Termination

The code for this module appeared in a previous article.

```
END InitReq;

PROCEDURE InitCoordEntry(VAR coords : ARRAY OF CoordinateType;
                         offset : CARDINAL;
                         left, top : INTEGER);
BEGIN
    WITH coords[offset] DO Left := left; Top := top  END;
END InitCoordEntry;

PROCEDURE SetUpSimpleBorder(VAR Coords: ARRAY OF CoordinateType;
                            GadWidth, GadHeight : CARDINAL;
                            VAR border : Border;
                            Left, Top : INTEGER;
                            Front, Back,
                            count : BYTE;
                            Mode : DrawModeSet;
                            NextBorder : BorderPtr);
BEGIN
     InitCoordEntry(Coords,0,0,0);
     InitCoordEntry(Coords,1,GadWidth+1,0);
     InitCoordEntry(Coords,2,GadWidth+1,GadHeight+1);
     InitCoordEntry(Coords,3,0,GadHeight+1);
     InitCoordEntry(Coords,4,0,0);
     InitBorder(border,Left,Top,Front,Back,count,Mode,
                ADR(Coords),NIL);
END SetUpSimpleBorder;

PROCEDURE AllocateStandardBorder(Width, Height : CARDINAL;
                       Front, Back : BYTE;
                            Mode : DrawModeSet): BorderPtr;
VAR
    BorderP : BorderPtr;
    CoordPtr: POINTER TO StandardCoordType;
BEGIN
    CoordPtr := AllocRemember(RKey, TSIZE(StandardCoordType),
                   MemReqSet{});
    BorderP := AllocRemember(RKey, TSIZE(Border), MemReqSet{});
    SetUpSimpleBorder(CoordPtr^,Width,Height,
                 BorderP^,-1,-1,Front,Back,BYTE(5),Mode,NIL);
    RETURN(BorderP);
END AllocateStandardBorder;

PROCEDURE AllocateReqBorder(Width, Height : CARDINAL;
                       Front, Back : BYTE;
                            Mode : DrawModeSet): BorderPtr;
VAR
    BorderP : BorderPtr;
    CoordPtr: POINTER TO StandardCoordType;
BEGIN
    CoordPtr := AllocRemember(RKey, TSIZE(StandardCoordType),
                   MemReqSet{});
    BorderP := AllocRemember(RKey, TSIZE(Border), MemReqSet{});
    SetUpSimpleBorder(CoordPtr^,Width-2,Height-2,
                 BorderP^,0,0,Front,Back,BYTE(5),Mode,NIL);
    RETURN(BorderP);
END AllocateReqBorder;

PROCEDURE AddGadgetToList(VAR GadList : GadgetPtr;
                          Left, Top : INTEGER;
                          width, height : INTEGER;
                          flags : GadgetFlagsSet;
                          Activate : GadgetActivationSet;
                          Type : GadgetTypeSet;
                          Render : ADDRESS;
                          Select : ADDRESS;
                          Special: ADDRESS;
                          ID     : CARDINAL;
                          User   : ADDRESS;
                          Text   : IntuiTextPtr) : GadgetPtr;
VAR
    GadP, tmp : GadgetPtr;
BEGIN
    GadP := AllocRemember(RKey, TSIZE(Gadget), MemReqSet{});
    tmp := InitGadget(GadP^, Left, Top, width, height, flags,
                Activate, Type, Render, Select, Special, ID,
                User, Text);
    GadP^.NextGadget := GadList;
    GadList := GadP;
    RETURN(GadP);
END AddGadgetToList;

PROCEDURE OpenSimpleScreen(width,height,depth : CARDINAL;
                      modeset : ViewModesSet;
                        Title : ADDRESS) : ScreenPtr;
VAR
    newScr        : NewScreen;
    MyScreen         : ScreenPtr;
BEGIN
    WITH newScr DO
         LeftEdge := 0;
         TopEdge := 0;
         Width := width;
         Height := height;
         Depth := depth;
         DetailPen := BYTE(0);
         BlockPen := BYTE(1);
           ViewModes := modeset;
         IF width > 320 THEN
              INCL(ViewModes,Hires)
         END;
           IF height > 200 THEN
                INCL(ViewModes,Lace)
           END;
         Font := NIL;
         DefaultTitle := Title;
         Gadgets := NIL;
         CustomBitMap := NIL;
           Type := CustomScreen;
    END;
    MyScreen := (OpenScreen(newScr));
    IF Title = NIL THEN
         ShowTitle(MyScreen^,FALSE);
    END;
    RETURN MyScreen
END OpenSimpleScreen;

PROCEDURE OpenSimpleWindow(width,height,left,top : CARDINAL;
                           title : ADDRESS;
                           flags : WindowFlagsSet;
                           idcmpflags : IDCMPFlagsSet;
                           gadget : GadgetPtr;
                           screen : ScreenPtr) : WindowPtr;
VAR
    MyNewWindow : NewWindow;
BEGIN
    WITH MyNewWindow DO
         LeftEdge := left;
         TopEdge := top;
         Height := height;
         Width := width;
         DetailPen := BYTE (0);
         BlockPen := BYTE (1);
         Title := title;
         Flags := flags;
         IDCMPFlags := idcmpflags;
         CheckMark := NIL;
         FirstGadget := gadget;
           IF screen <> NIL THEN
                Type := CustomScreen;
                Screen := screen;
           ELSE
                Type := WBenchScreen;
           END;
         BitMap := NIL;
         MinWidth := 0; MinHeight := 0;
         MaxWidth := 0; MaxHeight := 0;
    END;
    (* Now open the window *)
    RETURN OpenWindow(MyNewWindow);
END OpenSimpleWindow;

PROCEDURE SetScreenColors(screen : ScreenPtr;
                          data : ARRAY OF CHAR);
VAR
    size,
    i,j   : CARDINAL;
    table : ARRAY[0..31] OF CARDINAL;
    str     : ARRAY[0..2] OF CHAR;
    succ  : BOOLEAN;
    temp  : LONGCARD;
BEGIN
    i := StringLength(data);
    size := i DIV 4;
    IF (i MOD 4) <> 0 THEN INC(size) END;
    FOR i := 0 TO size - 1 DO
         FOR j := 0 TO 2 DO
             str[j] := data[(i*4)+j];
         END;
```

(continued)



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```
        succ := ConvStringToNumber(str,temp,FALSE,16);
        table[i] := temp;
    END;
     LoadRGB4(screen^.ViewPort,ADR(table),size);
END SetScreenColors;

BEGIN
    RKey := NIL;
     AddTerminator(ReleaseAllocations);
END IntuiCommon.
```

Listing Three
DEFINITION MODULE MSGlobal

```
DEFINITION MODULE MSGlobal;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                                                      *)
(*                 MultiSort Global module              *)
(*                                                      *)
(* Some declaration of record types and global variables *)
(*                                                      *)
(* Steve Faiwiszewski                        April 1988 *)
(*                                                      *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM Tasks      IMPORT  TaskPtr, SignalSet, SignalRange;
FROM Intuition  IMPORT  WindowPtr, ScreenPtr;
FROM Rasters    IMPORT  RastPortPtr;
FROM Ports      IMPORT  MsgPortPtr;

CONST
    ScreenWidth = 640;
    ScreenHeight = 400;
    WindowWidth = 190;
    WindowHeight = WindowWidth + 10;
    ScreenMidPoint = ScreenHeight DIV 2;
    ArraySize = WindowWidth - 3;
    ZoomArraySize = ScreenHeight - 13;
    ABORTED = 0FFFFH;
    MaxTasks = 6;

TYPE
    SortProc = PROCEDURE(RastPortPtr, VAR ARRAY OF CARDINAL,
                         CARDINAL, CARDINAL);

    WindowTitleType = ARRAY[0..10] OF CHAR;

    TaskRec = RECORD (* Task's context *)
                PrivateSignal : SignalSet;
                SigBit : SignalRange;
                Sorter : TaskPtr;
                FinishPlace,
                Color  : CARDINAL;
                Win   : WindowPtr;
                Sort  : SortProc;
                Name  : WindowTitleType;
                Busy  : BOOLEAN;
         END;

    ArrayType = ARRAY[0..ArraySize-1] OF CARDINAL;

    ZoomArrayType = ARRAY[0..ZoomArraySize-1] OF CARDINAL;

    InstructionType = (CopyArray, SortArray, AbortSort, Quit);

    InstructionSet = SET OF InstructionType;

VAR
    ParentTask : TaskPtr;
    TaskArray: ARRAY[0..MaxTasks - 1] OF TaskRec;
    GlobalCount : CARDINAL;
    GlobalInstruction : InstructionType;
    GlobalArray : ArrayType;
    ZoomGlobalArray : ZoomArrayType;
    ZoomedIn : BOOLEAN;
    NumOfTasks : CARDINAL;
    MSScreen : ScreenPtr;
    MainPort : MsgPortPtr;
    MainSignalSet : SignalSet;

END MSGlobal.
```

Listing Four
DEFINITION MODULE MSMisc

```
DEFINITION MODULE MSMisc;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                                                      *)
(*            MultiSort Miscellaneous Routines          *)
(*                                                      *)
(* Steve Faiwiszewski                        April 1988 *)
(*                                                      *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM MSGlobal   IMPORT  InstructionType;
FROM Intuition  IMPORT  WindowPtr;
FROM Rasters    IMPORT  RastPortPtr;
FROM Tasks      IMPORT  SignalRange;

PROCEDURE CloseWindowSafely(Win : WindowPtr);
(* Close window but make sure that all messages *)
(* have been processed first.                   *)

PROCEDURE AllocateSignal(VAR SigBit : SignalRange);

PROCEDURE WaitForResponses;

PROCEDURE SignalTasks(instruction : InstructionType);
(* Send 'instruction' to all the sort tasks *)

PROCEDURE UpdateDisplay(rp : RastPortPtr;
                         VAR array : ARRAY OF CARDINAL;
                         size, element, color : CARDINAL);
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(* Update the pixel position corresponding to the given    *)
(* array element number.                                    *)
(* Entry:                                                   *)
(*      rp    : RastPortPtr to the window to be updated    *)
(*      array : the array being sorted.  It's passed so    *)
(*              that the element's value can be accessed.  *)
(*              It's passed by reference for efficiency.   *)
(*      size  : the array size.                             *)
(*      element : the element whose pixel must be rendered *)
(*      color : rendering color                             *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
END MSMisc.
```

Listing Five
DEFINITION MODULE MSMenus

```
DEFINITION MODULE MSMenus;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                                                      *)
(*             MultiSort Menu Support Module            *)
(*                                                      *)
(* Steve Faiwiszewski                        April 1988 *)
(*                                                      *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM Intuition IMPORT MenuPtr;

CONST
    ItemData = 0;
    ItemStart = 1;
    ItemQuit = 2;
    SubAscending = 0;
    SubDescending = 1;
    SubRandom = 2;
    SubUniqRandom = 3;
    SubCustomized = 4;

VAR
    MenuStrip,
    SecondMenuStrip : MenuPtr;
```

```
PROCEDURE InitMenus(): MenuPtr;
(* Set up primary menu *)

PROCEDURE InitSecondMenu(): MenuPtr;
(* Set up secondary menu *)

PROCEDURE ConnectMenu(MenuStrip : MenuPtr);
(* Connect given menu to all the windows *)

PROCEDURE DisconnectMenu;
(* Disconnect the menu from all the windows *)

END MSMenus.
```

Listing Six
DEFINITION MODULE MSSortTask

```
DEFINITION MODULE MSSortTask;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                                                       *)
(*              MultiSort SorterTask module              *)
(*                                                       *)
(* Each created task runs the SorterTask procedure. This *)
(* procedure handles communication with the parent task, *)
(* as well as actually calling the sort procedure.       *)
(*                                                       *)
(* Steve Faiwiszewski                         April 1988 *)
(*                                                       *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

PROCEDURE SorterTask;

END MSSortTask.
```

Listing Seven
DEFINITION MODULE MSZoom

```
DEFINITION MODULE MSZoom;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                                                       *)
(*              MultiSort Zoom Routines                  *)
(*                                                       *)
(* Steve Faiwiszewski                         April 1988 *)
(*                                                       *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM Intuition IMPORT WindowPtr;

VAR
    ZoomWindow : WindowPtr;

PROCEDURE UnZoom;
(* Close the Zoom window *)

PROCEDURE Zoom(n : CARDINAL);
(* Open a Zoom window for the selected sort *)

PROCEDURE SortItZoomed;
(* Sort in the Zoom window, using the larger Zoom array *)

END MSZoom.
```

Listing Eight
DEFINITION MODULE MSData

```
DEFINITION MODULE MSData;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                                                       *)
(* MultiSort Data Collection and Organization Routines   *)
(*                                                       *)
(* Steve Faiwiszewski                         April 1988 *)
(*                                                       *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

PROCEDURE InitializeData(order : CARDINAL);
(* Set up the data in the array per user's request *)

END MSData.
```

Listings Nine—Twelve
"SORT" DEFINITION MODULEs

```
DEFINITION MODULE BubbleSort;

(* Steve Faiwiszewski                         April 1988 *)

FROM Rasters IMPORT RastPortPtr;

PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);

END BubbleSort.
```

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```
DEFINITION MODULE QuickSort;

(* Steve Faiwiszewski                         April 1988 *)

FROM Rasters IMPORT RastPortPtr;

PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);

END QuickSort.
```

```
DEFINITION MODULE HeapSort;

(* Steve Faiwiszewski                         April 1988 *)

FROM Rasters IMPORT RastPortPtr;

PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);

END HeapSort.
```

```
DEFINITION MODULE ShellSort;

(* Steve Faiwiszewski                         April 1988 *)

FROM Rasters IMPORT RastPortPtr;

PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);

END ShellSort.
```

(continued)

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Listing Thirteen
IMPLEMENTATION MODULE MSGlobal

```
IMPLEMENTATION MODULE MSGlobal;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                  MultiSort Global module                   *)
(*                                                            *)
(* This is where sorts are added to the program.             *)
(* To add a new sort, import the sort module, and add an *)
(* corresponding statement to the initialization section,*)
(* as shown below.  The sort procedure itself must be      *)
(* compatible with the declaration of SortProc.             *)
(*                                                            *)
(* Steve Faiwiszewski                              April 1988 *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

IMPORT BubbleSort;
IMPORT QuickSort;
IMPORT ShellSort;
IMPORT HeapSort;

FROM Tasks        IMPORT  NoSignals;

VAR
    i : CARDINAL;

PROCEDURE AddAsort(name : WindowTitleType; sort : SortProc);
(* Add a sort to the array of sort tasks *)
BEGIN
     WITH TaskArray[NumOfTasks] DO
         Name := name;
         Sort := sort;
         SigBit := NoSignals;
         Win := NIL;
         Sorter := NIL
     END;
     INC(NumOfTasks)
END AddAsort;

BEGIN
     NumOfTasks := 0;
     AddAsort('Bubble      ',BubbleSort.Sort);
     AddAsort('Quick       ',QuickSort.Sort);
     AddAsort('Shell       ',ShellSort.Sort);
     AddAsort('Heap        ',HeapSort.Sort);
END MSGlobal.
```

Listing Fourteen
IMPLEMENTATION MODULE MSMisc

```
IMPLEMENTATION MODULE MSMisc;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*               MultiSort Miscellaneous Routines            *)
(* Steve Faiwiszewski                              April 1988 *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM MSGlobal    IMPORT  InstructionType, GlobalInstruction,
                          NumOfTasks, TaskArray, MainPort,
                          MainSignalSet;
FROM Termination IMPORT ExitGracefully;

FROM Intuition   IMPORT  WindowPtr, IntuiMessagePtr,  MenuPick,
                          MenuNull, IDCMPFlagsSet, ModifyIDCMP,
                          CloseWindow, ITEMNUM, MENUNUM;
FROM Interrupts IMPORT  Forbid, Permit;
FROM Tasks       IMPORT  Signal, SignalSet, Wait;
FROM Ports       IMPORT  GetMsg, ReplyMsg, MsgPortPtr;
FROM Lists       IMPORT  Remove;
FROM AmigaDOS    IMPORT  SigBreakCtrlC;
FROM Drawing     IMPORT  Move, Draw, SetAPen, WritePixel;
FROM Rasters     IMPORT  RastPortPtr;
FROM Tasks       IMPORT  SignalRange, AllocSignal, AnySignal,
                          NoSignals;

CONST
    DrawOffset = 10;

PROCEDURE StripIntuiMessages(mp : MsgPortPtr;
                              Win : WindowPtr);
(* Remove all messages from port *)
VAR
    msg,
    succ : IntuiMessagePtr;
BEGIN
     msg := IntuiMessagePtr(mp^.mpMsgList.lhHead);
     WHILE msg^.ExecMessage.mnNode.lnSucc <> NIL DO
          succ := IntuiMessagePtr(msg^.ExecMessage.mnNode.lnSucc);
         IF msg^.IDCMPWindow = Win THEN
              Remove(msg^.ExecMessage.mnNode);
              ReplyMsg(msg)
         END;
         msg := succ;
    END;
END StripIntuiMessages;

PROCEDURE CloseWindowSafely(Win : WindowPtr);
BEGIN
    Forbid; (* make sure nobody gets a chance to send us *)
            (* new msgs *)
     StripIntuiMessages(Win^.UserPort,Win);
 (* make sure Intuition doesn't  close the IDCMP port *)
    Win^.UserPort := NIL;
     ModifyIDCMP(Win^,IDCMPFlagsSet{});
    Permit;
    CloseWindow(Win^);
END CloseWindowSafely;
```

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```
PROCEDURE AllocateSignal(VAR SigBit : SignalRange);
BEGIN
     SigBit := AllocSignal(AnySignal);
     IF SigBit = NoSignals THEN ExitGracefully(9) END;
END AllocateSignal;


PROCEDURE WaitForResponses;
(* Wait till all tasks signal. *)
VAR
     i,
     TotalSignals : CARDINAL;
     sig          : SignalSet;
     mp           : IntuiMessagePtr;
     class        : IDCMPFlagsSet;
     code         : CARDINAL;
BEGIN
     TotalSignals := 0;
     REPEAT
         sig := Wait(MainSignalSet);
         IF SigBreakCtrlC IN sig THEN ExitGracefully(99) END;
         IF CARDINAL(MainPort^.mpSigBit) IN sig THEN
             mp := GetMsg(MainPort^);
             WHILE mp <> NIL DO
                 class := mp^.Class;
                 code := mp^.Code;
                 ReplyMsg(mp);
                 IF (MenuPick IN class) AND
                   (code <> MenuNull) THEN
         (* we only have one menu option: abort *)
                     IF (MENUNUM(code) = 0) AND
                       (ITEMNUM(code) = 0) THEN
                         GlobalInstruction := AbortSort;
                     END;
                 END;
                  mp := IntuiMessagePtr(GetMsg(MainPort^));
             END;
         END;
         FOR i := 0 TO NumOfTasks - 1 DO
             IF CARDINAL(TaskArray[i].SigBit) IN sig THEN
                 INC(TotalSignals);
             END;
         END;
     UNTIL (TotalSignals = NumOfTasks);
END WaitForResponses;


PROCEDURE SignalTasks(instruction : InstructionType);

VAR i : CARDINAL;
BEGIN
     GlobalInstruction := instruction;
(* make sure tasks only run after they all have been *)
```

(continued)

```
(* signalled *)
     Forbid;
     FOR i := 0 TO NumOfTasks - 1 DO
          WITH TaskArray[i] DO
               Signal(Sorter^,PrivateSignal);
          END;
     END;
     Permit;
     WaitForResponses
END SignalTasks;


PROCEDURE UpdateDisplay(rp : RastPortPtr;
                        VAR array : ARRAY OF CARDINAL;
                        size, element, color : CARDINAL);
VAR
     dummy : INTEGER;
     x     : CARDINAL;
BEGIN
     SetAPen(rp^,0);
     x := element + 1;
     Move(rp^,x,DrawOffset);
     Draw(rp^,x,DrawOffset+size);
     SetAPen(rp^,color);
     dummy := WritePixel(rp^,x,DrawOffset + array[element]);
END UpdateDisplay;

END MSMisc.
```

Listing Fifteen
IMPLEMENTATION MODULE MSMenus

```
IMPLEMENTATION MODULE MSMenus;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                MultiSort Menu Support Module               *)
(* Steve Faiwiszewski                              April 1988 *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM MSGlobal     IMPORT NumOfTasks, TaskArray, WindowTitleType;
FROM IntuiCommon  IMPORT InitMenuRec, InitItemRec, InitTextRec;
FROM Termination  IMPORT AddTerminator, ExitGracefully;

FROM TermInOut    IMPORT WriteString, WriteLn;
FROM Intuition    IMPORT Menu, MenuPtr, MenuItem, MenuItemPtr,
                         IntuiText, IntuiTextPtr,
                         ClearMenuStrip, MenuItemFlags,
                         MenuItemFlagsSet, SetMenuStrip,
                         MenuItemMutualExcludeSet,
                         RememberPtr, AllocRemember,
                         FreeRemember;
FROM Memory       IMPORT MemReqSet, MemClear;
FROM Rasters      IMPORT Jam2;
FROM SYSTEM       IMPORT ADR, BYTE, TSIZE;

CONST
     MainMenuWidth = 90;
     SubMenuWidth = 140;

VAR
     MyMenu,
     ZoomMenu,
     MySecMenu       : Menu;
     ZoomItem        : MenuItem;
     ZoomText        : IntuiText;
     DataItems       : ARRAY[0..4] OF MenuItem;
     MyMenuItems     : ARRAY[0..2] OF MenuItem;
     MySecMenuItems  : ARRAY[0..0] OF MenuItem;
     DataText        : ARRAY[0..4] OF IntuiText;
     MyMenuText      : ARRAY[0..2] OF IntuiText;
     MySecMenuText   : ARRAY[0..0] OF IntuiText;
     RKey            : RememberPtr;


PROCEDURE Cleanup;
BEGIN
     FreeRemember(RKey,TRUE)
END Cleanup;


PROCEDURE InitZoomMenu(MenuStrip : MenuPtr);
(* Set up the Zoom menu *)
VAR
     ItemPtr,
     Previous : MenuItemPtr;
     TextPtr  : IntuiTextPtr;
     i,j,k    : CARDINAL;
     NamePtr  : POINTER TO WindowTitleType;
BEGIN
     MenuStrip^.NextMenu := InitMenuRec(ZoomMenu,
                               MainMenuWidth+3,0,
                               MainMenuWidth,10,
                               ADR(‘ Zoom’));
     ZoomMenu.FirstItem :=
        InitItemRec(ZoomItem,0,0,MainMenuWidth,10,0C,
          InitTextRec(ZoomText,18,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘All’)));
     WITH ZoomItem DO
          Flags := Flags + MenuItemFlagsSet{CheckIt,Checked};
          MutualExclude := MenuItemMutualExcludeSet(0FFFFFFFFH);
          EXCL(MutualExclude,0)
     END;
     Previous := ZoomMenu.FirstItem;

     FOR i := 1 TO NumOfTasks DO
          ItemPtr := AllocRemember(RKey, TSIZE(MenuItem),
                                   MemReqSet{MemClear});
          IF ItemPtr = NIL THEN
               WriteString(
                    ‘Could not allocate a MenuItem record!’);
               WriteLn;
               ExitGracefully(999)
          END;
          TextPtr := AllocRemember(RKey, TSIZE(IntuiText),
                                   MemReqSet{MemClear});
          IF TextPtr = NIL THEN
               WriteString(
                    ‘Could not allocate a IntuiText record!’);
               WriteLn;
               ExitGracefully(999)
          END;
          Previous^.NextItem := ItemPtr;
          Previous := ItemPtr;
          WITH TaskArray[i-1] DO
               j := 0;
               WHILE (Name[j] <> ‘ ’) AND
                 (j < TSIZE(WindowTitleType)) DO
                    INC(j)
               END;
               NamePtr := AllocRemember(RKey, j,
                                   MemReqSet{MemClear});
               FOR k := 0 TO j - 1 DO NamePtr^[k] := Name[k] END;
          END;
          ItemPtr :=
             InitItemRec(ItemPtr^,0,i*10,MainMenuWidth,10,0C,
               InitTextRec(TextPtr^,18,1,BYTE(0),BYTE(1),Jam2,
                    NamePtr));
          WITH ItemPtr^ DO
               INCL(Flags,CheckIt);
               MutualExclude :=
                    MenuItemMutualExcludeSet(0FFFFFFFFH);
               EXCL(MutualExclude,i)
          END;
     END;
END InitZoomMenu;


PROCEDURE InitMenus(): MenuPtr;
VAR
     MenuStrip : MenuPtr;
BEGIN
     MenuStrip := InitMenuRec(MyMenu,3,0,MainMenuWidth,10,
                              ADR(‘ Action’));

     MyMenu.FirstItem :=
        InitItemRec(MyMenuItems[0],0,0,MainMenuWidth,10,0C,
          InitTextRec(MyMenuText[0],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Data’)));

     MyMenuItems[0].SubItem :=
        InitItemRec(DataItems[0],MainMenuWidth DIV 2,0,
               SubMenuWidth,10,’A’,
          InitTextRec(DataText[0],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Ascending’)));

     DataItems[0].NextItem :=
        InitItemRec(DataItems[1],MainMenuWidth DIV 2,10,
               SubMenuWidth,10,’D’,
          InitTextRec(DataText[1],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Descending’)));

     DataItems[1].NextItem :=
        InitItemRec(DataItems[2],MainMenuWidth DIV 2,20,
               SubMenuWidth,10,’R’,
          InitTextRec(DataText[2],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Random’)));

     DataItems[2].NextItem :=
        InitItemRec(DataItems[3],MainMenuWidth DIV 2,30,
               SubMenuWidth,10,’U’,
          InitTextRec(DataText[3],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Unique Random’)));

     DataItems[3].NextItem :=
        InitItemRec(DataItems[4],MainMenuWidth DIV 2,40,
               SubMenuWidth,10,’C’,
          InitTextRec(DataText[4],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Customized’)));

     MyMenuItems[0].NextItem :=
        InitItemRec(MyMenuItems[1],0,10,MainMenuWidth,10,’S’,
          InitTextRec(MyMenuText[1],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Start’)));

     MyMenuItems[1].NextItem :=
        InitItemRec(MyMenuItems[2],0,20,MainMenuWidth,10,’Q’,
          InitTextRec(MyMenuText[2],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Quit’)));

     InitZoomMenu(MenuStrip);

     RETURN MenuStrip
END InitMenus;


PROCEDURE InitSecondMenu(): MenuPtr;
VAR
     MenuStrip : MenuPtr;
BEGIN
     MenuStrip := InitMenuRec(MySecMenu,3,0,78,10,
               ADR(‘ Action’));

     MySecMenu.FirstItem :=
        InitItemRec(MySecMenuItems[0],0,0,MainMenuWidth,10,’S’,
          InitTextRec(MySecMenuText[0],0,1,BYTE(0),BYTE(1),Jam2,
               ADR(‘Stop’)));

     RETURN MenuStrip
END InitSecondMenu;


PROCEDURE DisconnectMenu;
VAR i : CARDINAL;
BEGIN
```

```
    FOR i := 0 TO NumOfTasks - 1 DO
         ClearMenuStrip(TaskArray[i].Win^)
    END;
END DisconnectMenu;


PROCEDURE ConnectMenu(MenuStrip : MenuPtr);
VAR i : CARDINAL;
BEGIN
    FOR i := 0 TO NumOfTasks - 1 DO
         SetMenuStrip(TaskArray[i].Win^,MenuStrip^)
    END;
END ConnectMenu;


BEGIN
    RKey := NIL;
     AddTerminator(Cleanup)
END MSMenus.
```

Listing Sixteen
IMPLEMENTATION MODULE MSSortTask

```
IMPLEMENTATION MODULE MSSortTask;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                MultiSort SorterTask module                 *)
(* Steve Faiwiszewski                              April 1988 *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM MSGlobal    IMPORT  ArraySize, InstructionType,  ABORTED,
                         TaskArray, GlobalCount, GlobalArray,
                         GlobalInstruction, ParentTask,
                        ArrayType;
FROM MSMisc      IMPORT  AllocateSignal, UpdateDisplay;
FROM Interrupts IMPORT  Forbid, Permit;
FROM Tasks       IMPORT  SignalRange, SignalSet, Signal, Wait,
                        FreeSignal;


PROCEDURE SorterTask;
VAR
    i,
    TaskNum : CARDINAL;
    LocalArray : ArrayType;
    LocalSigBit : SignalRange;
    sig,
    ParentSignal: SignalSet;
    NeedToCopyArray : BOOLEAN;

PROCEDURE CopyArrayIfNeedTo;
VAR i : CARDINAL;
BEGIN
    WITH TaskArray[TaskNum] DO
         IF (GlobalInstruction = CopyArray) OR
            (NeedToCopyArray AND (GlobalInstruction <> Quit)) THEN
             LocalArray := GlobalArray;
             FOR i := 0 TO ArraySize-1 DO
                  UpdateDisplay(Win^.RPort,LocalArray,
                                    ArraySize,i,Color)
             END;
             NeedToCopyArray := FALSE;
         END; (* if *)
    END; (* with *)
END CopyArrayIfNeedTo;

PROCEDURE SortLocalArray;
BEGIN
    WITH TaskArray[TaskNum] DO
         Busy := TRUE;
          Sort(Win^.RPort,LocalArray,ArraySize,Color);
         Busy := FALSE;
  (* assure we'll be the only task that gets to modify   *)
  (* GlobalCount                                         *)
         Forbid;
          IF GlobalInstruction = AbortSort THEN
              FinishPlace := ABORTED
         ELSE
              INC(GlobalCount);
              FinishPlace := GlobalCount;
         END;
         Permit;
          NeedToCopyArray := TRUE;
    END; (* with *)
END SortLocalArray;

BEGIN (* SorterTask *)
  (* make sure no other task gets to run, since we'll be *)
  (* modifying global data.                              *)
    Forbid;
    TaskNum := GlobalCount;
    INC(GlobalCount);
    Permit; (* Since we got our task number we can *)
            (* safely allow other tasks to run     *)
    NeedToCopyArray := FALSE;
    WITH TaskArray[TaskNum] DO
         PrivateSignal := SignalSet{};
         AllocateSignal(LocalSigBit);
          INCL(PrivateSignal,CARDINAL(LocalSigBit));
         ParentSignal := SignalSet{};
          INCL(ParentSignal,CARDINAL(SigBit));
         REPEAT
                 (* Tell parent we're ready *)
              Signal(ParentTask^,ParentSignal);
                  (* wait for instructions *)
              sig:= Wait(PrivateSignal);
              CopyArrayIfNeedTo;
              IF GlobalInstruction = SortArray THEN
                   SortLocalArray
              END;
           UNTIL GlobalInstruction = Quit;
           Sorter := NIL;
      END; (* with *)
  (* Tell parent we're quitting *)
      Signal(ParentTask^,ParentSignal);
      FreeSignal(LocalSigBit);
END SorterTask;

END MSSortTask.
```

Listing Seventeen
IMPLEMENTATION MODULE MSZoom

```
IMPLEMENTATION MODULE MSZoom;

(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)
(*                MultiSort Zoom Routines                     *)
(* Steve Faiwiszewski                              April 1988 *)
(* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *)

FROM MSGlobal    IMPORT  ZoomedIn, ZoomArraySize, ScreenHeight,
                         ScreenWidth, MSScreen, TaskArray,
                         MainPort, GlobalInstruction,
                         InstructionType, ZoomGlobalArray;
FROM MSMisc      IMPORT  CloseWindowSafely, UpdateDisplay;
FROM MSMenus     IMPORT  MenuStrip, SecondMenuStrip,
                         SubUniqRandom;
FROM MSData      IMPORT  InitializeData;
FROM IntuiCommon IMPORT  OpenSimpleWindow;
FROM Termination IMPORT  ExitGracefully;
FROM Intuition   IMPORT  WindowPtr, WindowFlagsSet,
                          SmartRefresh, IDCMPFlags, WindowFlags,
                          IDCMPFlagsSet, ModifyIDCMP,
                          ClearMenuStrip, SetMenuStrip,
                         SetWindowTitles;
FROM SYSTEM      IMPORT  ADR, ADDRESS;

VAR
    ZoomSort : CARDINAL;

PROCEDURE UnZoom;
BEGIN
    IF ZoomedIn THEN
         ClearMenuStrip(ZoomWindow^);
         CloseWindowSafely(ZoomWindow);
        ZoomedIn := FALSE
    END;
END UnZoom;


PROCEDURE Zoom(n : CARDINAL);
VAR
```

(continued)

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```
    j : CARDINAL;
BEGIN
    UnZoom;
    IF n > 0 THEN
        ZoomWindow := OpenSimpleWindow(ZoomArraySize + 3,
            ScreenHeight,
            (ScreenWidth - ZoomArraySize - 3) DIV 2, 0, NIL,
            WindowFlagsSet{Activate,WindowDrag,NoCareRefresh} +
                SmartRefresh, IDCMPFlagsSet{}, MSScreen);
        IF ZoomWindow = NIL THEN ExitGracefully(99) END;
        ZoomWindow^.UserPort := MainPort;
        ModifyIDCMP(ZoomWindow^,IDCMPFlagsSet{MenuPick});
        SetMenuStrip(ZoomWindow^,MenuStrip^);
        ZoomSort := n-1;
        WITH TaskArray[ZoomSort] DO
            FOR j := 7 TO 9 DO Name[j] := ' ' END;
            SetWindowTitles(ZoomWindow^,ADR(Name),ADDRESS(-1));
        END;
        ZoomedIn := TRUE;
        InitializeData(SubUniqRandom);
    END;
END Zoom;


PROCEDURE SortItZoomed;
BEGIN
    GlobalInstruction := SortArray;
    ClearMenuStrip(ZoomWindow^);
    SetMenuStrip(ZoomWindow^,SecondMenuStrip^);
    TaskArray[ZoomSort].Sort(ZoomWindow^.RPort,
                ZoomGlobalArray,ZoomArraySize,3);
    ClearMenuStrip(ZoomWindow^);
    SetMenuStrip(ZoomWindow^,MenuStrip^);
END SortItZoomed;

END MSZoom.
```

Listing Eighteen
IMPLEMENTATION MODULE MSData

```
IMPLEMENTATION MODULE MSData;


FROM MSGlobal    IMPORT  ZoomedIn, ZoomArraySize, ScreenHeight,
                         ScreenWidth, WindowWidth, MSScreen,
                         WindowHeight, ArraySize,
                         ZoomGlobalArray, GlobalArray,
                         InstructionType;
FROM MSMisc      IMPORT  UpdateDisplay, CloseWindowSafely,
                         SignalTasks;
FROM MSMenus     IMPORT  SubCustomized, SubAscending,
                         SubDescending, SubUniqRandom,
                         SubRandom;
FROM MSZoom      IMPORT  ZoomWindow;
FROM IntuiCommon IMPORT OpenSimpleWindow;
FROM Termination IMPORT AddTerminator, ExitGracefully;

FROM TermInOut   IMPORT  WriteString, WriteLn;
FROM MathLib0    IMPORT  real;
FROM InitMathLib0
                 IMPORT  OpenMathLib0, CloseMathLib0;
FROM RandomNumbers
                 IMPORT  Random;
FROM Ports       IMPORT  MsgPortPtr, GetMsg, ReplyMsg,
                         WaitPort;
FROM InputEvents
                 IMPORT  IECodeLButton;
FROM Intuition   IMPORT  WindowPtr, IntuiMessagePtr, IDCMPFlags,
                         IDCMPFlagsSet, WindowFlags,
                         WindowFlagsSet, SmartRefresh,
                         ReportMouse;
FROM SYSTEM      IMPORT  ADR;


PROCEDURE CollectData(limit : INTEGER;
                      VAR Array : ARRAY OF CARDINAL);
VAR
    Win          : WindowPtr;
    mp           : IntuiMessagePtr;
    class        : IDCMPFlagsSet;
    width, height,
    left, top,
    temp,
    code         : CARDINAL;
    start, finish,
    i, x,y,
    OldY,
    OldX         : INTEGER;
    m,b          : REAL;
    stop         : BOOLEAN;
BEGIN
    IF ZoomedIn THEN
        width := ZoomArraySize + 3;
        height := ScreenHeight;
        left := (ScreenWidth - ZoomArraySize - 3) DIV 2;
        top := 0;
    ELSE
        width := WindowWidth;
        height := WindowHeight;
        left := (ScreenWidth - WindowWidth) DIV 2;
        top := (ScreenHeight - WindowHeight) DIV 2;
    END;
    Win := OpenSimpleWindow(width, height, left, top,
                ADR('Data Entry Window'),
                WindowFlagsSet{Activate,WindowClose,
                        NoCareRefresh} + SmartRefresh,
                IDCMPFlagsSet{Closewindow, MouseMove,
                        MouseButtons, MenuPick},
                MSScreen);
    stop := FALSE;
    REPEAT
        mp := WaitPort(Win^.UserPort^);
        LOOP
            mp := GetMsg(Win^.UserPort^);
            IF mp = NIL THEN EXIT END;
            WITH mp^ DO
                code := Code;
                class := Class;
                x := MouseX;
                y := MouseY;
            END; (* with *)
            ReplyMsg(mp);
            IF (class = IDCMPFlagsSet{MouseButtons}) AND
             (x >= 0) AND (x < limit) AND (y >= 0) AND
             (y < limit) THEN
                IF code = IECodeLButton THEN
                 (* button was pressed down *)
                    Array[x] := y;
                    UpdateDisplay(Win^.RPort,Array,limit,x,2);
                    OldX := x; OldY := y;
                    ReportMouse(Win^,TRUE);
                ELSE
                    ReportMouse(Win^,FALSE);
                END;
            ELSIF (class = IDCMPFlagsSet{MouseMove}) AND
             (x < limit) AND (x >= 0) AND (y >= 0) AND
             (y < limit) THEN
                IF x = OldX THEN
                    Array[x] := y;
                    UpdateDisplay(Win^.RPort,Array,limit,x,2);
                ELSE
                    m := real(y - OldY) / real(x - OldX);
                    b := real(OldY) - m * real(OldX);
                    IF x > OldX THEN
                        start := OldX; finish := x
                    ELSE
                        start := x; finish := OldX
                    END;
                    FOR i := start TO finish DO
                        temp := TRUNC(m * real(i) + b);
                        Array[i] := temp;
                        UpdateDisplay(Win^.RPort,Array,
                                      limit,i,2);
                    END;
                END;
                OldX := x; OldY := y;
            ELSIF class = IDCMPFlagsSet{Closewindow} THEN
                stop := TRUE;
                EXIT
            END;
        END; (* loop *)
    UNTIL stop;
    CloseWindowSafely(Win)
END CollectData;


PROCEDURE InitializeArray(order,limit : CARDINAL;
                          VAR Array : ARRAY OF CARDINAL);
VAR
    i,j : CARDINAL;
    stop: BOOLEAN;
BEGIN
 (* first initialize array to 0 *)
    FOR i := 0 TO limit - 1 DO
        Array[i] := 0;
    END;
    IF order = SubCustomized THEN
        CollectData(limit,Array)
    ELSE
        FOR i := 0 TO limit - 1 DO
            CASE order OF
                SubAscending  : Array[i] := i + 1
                |
                SubDescending : Array[i] := limit - i
                |
                SubUniqRandom : REPEAT
                                  j :=
                                    CARDINAL(Random(limit));
                                  stop := Array[j] = 0
                                UNTIL stop;
                                Array[j] := i
                |
                SubRandom     : Array[i] :=
                                    CARDINAL(Random(limit));
                ELSE
            END; (* case *)
        END; (* for i ... *)
    END; (* if ... *)
END InitializeArray;


PROCEDURE InitializeData(order : CARDINAL);
VAR
    i : CARDINAL;
BEGIN
    IF ZoomedIn THEN
         InitializeArray(order,ZoomArraySize,ZoomGlobalArray);
        FOR i := 0 TO ZoomArraySize - 1 DO
            UpdateDisplay(ZoomWindow^.RPort,ZoomGlobalArray,
                          ZoomArraySize,i,3);
        END
    ELSE
         InitializeArray(order,ArraySize,GlobalArray);
        SignalTasks(CopyArray)
    END
END InitializeData;

PROCEDURE Cleanup;
BEGIN
    CloseMathLib0;
END Cleanup;
```

```
BEGIN
    IF OpenMathLib0()  THEN
        AddTerminator(Cleanup);
    ELSE
        WriteString('Could not open Math lib!'); WriteLn;
        ExitGracefully(99)
    END;
END MSData.
```

Listing Nineteen
IMPLEMENTATION MODULE BubbleSort

```
IMPLEMENTATION MODULE BubbleSort;


FROM MSGlobal IMPORT GlobalInstruction, InstructionType;
FROM MSMisc  IMPORT UpdateDisplay;
FROM Rasters IMPORT RastPortPtr;

PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);
VAR
    i,j,
    pass,
    high,
    temp : CARDINAL;
    Changed : BOOLEAN;
BEGIN
    Changed := TRUE;
    pass := 0;
    high := size - 1;
    WHILE (pass < high) AND Changed DO
        Changed := FALSE;
        FOR j := 0 TO high - pass -1 DO
            IF array[j] > array[j+1] THEN
                Changed := TRUE;
                temp := array[j];
                array[j] := array[j+1];
                 UpdateDisplay(Rport,array,size,j,color);
                array[j+1] := temp;
                 UpdateDisplay(Rport,array,size,j+1,color);
            END;
            IF GlobalInstruction = AbortSort THEN RETURN END
        END;
        INC(pass)
    END;
END Sort;

END BubbleSort.
```

Listing Twenty
IMPLEMENTATION MODULE QuickSort

```
IMPLEMENTATION MODULE QuickSort;

FROM MSMisc  IMPORT UpdateDisplay;
FROM Rasters IMPORT RastPortPtr;

PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);

PROCEDURE Rearrange(lb,ub : INTEGER; VAR j : INTEGER);
(* Variables are declared as INTEGER    *)
(* since ub can go negative             *)
VAR
    a : CARDINAL;
    up, down : INTEGER;
BEGIN
    a := array[lb];
    j := lb;
    up := ub;
    down := lb;
    REPEAT
        WHILE (up > down) AND (array[up] >= a) DO
         (* move down the array *)
            DEC(up)
        END;
        j := up;
        IF up <> down THEN
            array[down] := array[up];
             UpdateDisplay(Rport,array,size,down,color);

            WHILE (down < up) AND (array[down] <= a) DO
         (* move up the array *)
                INC(down)
            END;
            j := down;
            IF down <> up THEN
                array[up] := array[down];
                 UpdateDisplay(Rport,array,size,up,color);
            END;
        END;
    UNTIL down = up;
    array[j] := a;
     UpdateDisplay(Rport,array,size,j,color);
END Rearrange;

PROCEDURE quick(lb, ub : INTEGER);
(* j is declared as INTEGER 'cause it can go negative *)
VAR
    j : INTEGER;
BEGIN
    IF lb < ub THEN
        Rearrange(lb,ub,j);
        quick(lb,j-1);
        quick(j+1,ub)
    END;
END quick;

BEGIN
    quick(0,size-1)
END Sort;

END QuickSort.
```

Listing Twenty-one
IMPLEMENTATION MODULE HeapSort

```
IMPLEMENTATION MODULE HeapSort;

FROM MSMisc  IMPORT UpdateDisplay;
FROM Rasters IMPORT RastPortPtr;


PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);
VAR
    i,j : INTEGER;
    k,y : CARDINAL;
BEGIN
    FOR k := 2 TO size DO
        i := k;
        j := i DIV 2;
        y := array[k-1];
        WHILE (j > 0) AND (y > array[j-1]) DO
            array[i-1] := array[j-1];
             UpdateDisplay(Rport,array,size,i-1,color);
            i := j;
            j := i DIV 2;
        END; (* while *)
        array[i-1] := y;
         UpdateDisplay(Rport,array,size,i-1,color);
    END;
    FOR k := size TO 2 BY -1 DO
        y := array[k-1];
        array[k-1] := array[0];
         UpdateDisplay(Rport,array,size,k-1,color);
        i := 1;
        j := 2;
        IF (array[2] > array[1]) AND (k-1 >= 3) THEN
            j := 3
        END;
        WHILE (j <= INTEGER(k-1)) AND (array[j-1] > y) DO
            array[i-1] := array[j-1];
             UpdateDisplay(Rport,array,size,i-1,color);
            i := j;
            j := 2 * i;
            IF (j+1 <= INTEGER(k-1)) AND
              (array[j] > array[j-1]) THEN
                INC(j)
            END;
        END; (* while *)
        array[i-1] := y;
         UpdateDisplay(Rport,array,size,i-1,color);
    END;
END Sort;

END HeapSort.
```

Listing Twenty-two
IMPLEMENTATION MODULE ShellSort

```
IMPLEMENTATION MODULE ShellSort;

FROM MSMisc  IMPORT UpdateDisplay;
FROM Rasters IMPORT RastPortPtr;


PROCEDURE Sort(Rport : RastPortPtr;
               VAR array : ARRAY OF CARDINAL;
               size, color : CARDINAL);

(
VAR
    temp : CARDINAL;
    i,j,
    k,j2,
    Incr : INTEGER;
BEGIN
    Incr := size DIV 2;
    WHILE Incr > 0 DO
        FOR i := Incr TO INTEGER(size-1) DO
            j := i - Incr;
            WHILE j >= 0 DO
                IF array[j] > array[Incr+j] THEN
                    temp := array[j];
                    array[j] := array[Incr+j];
                    array[Incr+j] := temp;
                     UpdateDisplay(Rport,array,size,j,color);
                     UpdateDisplay(Rport,array,size,Incr+j,
                                   color);
                    DEC(j,Incr)
                ELSE
                    j := -1
                END;
            END;
        END;
        Incr := Incr DIV 2;
    END;
END Sort;
END ShellSort.
```

(continued)

Listing Twenty-three
MODULE MultiSort

```
MODULE MultiSort;

(*                      MultiSort                                *)
(* Steve Faiwiszewski                                April 1988 *)

FROM MSGlobal    IMPORT  NumOfTasks, TaskArray, ParentTask,
                         InstructionType, GlobalCount,
                         ScreenWidth, ScreenHeight, ABORTED,
                         ScreenMidPoint, WindowWidth,
                         WindowHeight, MSScreen, MainPort,
                         MainSignalSet, ZoomedIn;
FROM MSMenus     IMPORT  InitMenus, InitSecondMenu,
                         DisconnectMenu, ConnectMenu, ItemData,
                         ItemStart, ItemQuit, SubUniqRandom,
                         MenuStrip,SecondMenuStrip;
FROM MSMisc      IMPORT  CloseWindowSafely, UpdateDisplay,
                         AllocateSignal, SignalTasks,
                         WaitForResponses;
FROM MSZoom      IMPORT  UnZoom, Zoom, SortItZoomed;
FROM MSData      IMPORT  InitializeData;
FROM MSSortTask IMPORT  SorterTask;
FROM Termination IMPORT AddTerminator, ExitGracefully;
FROM IntuiCommon IMPORT OpenSimpleScreen, OpenSimpleWindow,
                         SetScreenColors;
FROM TermInOut   IMPORT  WriteString, WriteLn;
FROM Views       IMPORT  ViewModesSet;
FROM Interrupts IMPORT  Forbid, Permit;
FROM AmigaDOS    IMPORT  SigBreakCtrlC;
FROM Tasks       IMPORT  CurrentTask, FindTask, Signal, Wait,
                         SetSignal, SignalSet, AllocSignal,
                         FreeSignal, NoSignals;
FROM TasksUtil   IMPORT  CreateTask, DeleteTask;
FROM Ports       IMPORT  GetMsg, ReplyMsg;
FROM PortsUtil   IMPORT  CreatePort, DeletePort;
FROM Intuition   IMPORT  SetWindowTitles, SetMenuStrip,
                         ClearMenuStrip, ModifyIDCMP,
                         IntuiMessagePtr, CloseScreen,
                         SmartRefresh, MENUNUM, ITEMNUM,
                         SUBNUM, MenuNull, WindowFlags,
                         WindowFlagsSet, IDCMPFlags,
                         IDCMPFlagsSet;
FROM SYSTEM      IMPORT  ADR, ADDRESS;


PROCEDURE Cleanup;
VAR
    i : CARDINAL;
BEGIN
    UnZoom;
    FOR i := 0 TO NumOfTasks-1 DO
        WITH TaskArray[i] DO
            IF Sorter <> NIL THEN DeleteTask(Sorter) END;
            IF SigBit <> NoSignals THEN
                FreeSignal(SigBit)
            END;
            IF Win <> NIL THEN
                ClearMenuStrip(Win^);
                CloseWindowSafely(Win);
            END;
        END;
    END;
    IF MSScreen <> NIL THEN CloseScreen(MSScreen^) END;
    DeletePort(MainPort^);
END Cleanup;


PROCEDURE Setup;
VAR
    i,
    CurrentWindowTop,
    CurrentWindowLeft : CARDINAL;
BEGIN
    ParentTask := FindTask(CurrentTask);
    GlobalCount := 0;
    MSScreen := NIL;
    MainPort := CreatePort(NIL,0);
    CurrentWindowLeft := 0;
    CurrentWindowTop := 0;
    MSScreen := OpenSimpleScreen(ScreenWidth,ScreenHeight,3,
                ViewModesSet{},
                ADR('MultiSorts - by Steve Faiwiszewski'));
(* black, white, red, orange, limegreen, aqua, purple, tan *)
    SetScreenColors(MSScreen,
                '000 FFF E30 FB0 5D0 7DF F0F FEB');
    MenuStrip := InitMenus();
    SecondMenuStrip := InitSecondMenu();
    MainSignalSet := SignalSet{};
     INCL(MainSignalSet,CARDINAL(MainPort^.mpSigBit));
     INCL(MainSignalSet,SigBreakCtrlC);
    FOR i := 0 TO NumOfTasks-1 DO
        WITH TaskArray[i] DO
            AllocateSignal(SigBit);
             INCL(MainSignalSet,CARDINAL(SigBit));
             Win := OpenSimpleWindow(WindowWidth,WindowHeight,
                 CurrentWindowLeft, CurrentWindowTop,NIL,
                 WindowFlagsSet{Activate,WindowDrag,WindowDepth,
                         NoCareRefresh} + SmartRefresh,
                         IDCMPFlagsSet{}, MSScreen);
            IF Win = NIL THEN ExitGracefully(99) END;
            Win^.UserPort := MainPort;
             ModifyIDCMP(Win^,IDCMPFlagsSet{MenuPick});
             SetMenuStrip(Win^,MenuStrip^);
            Color := i + 3;
             SetWindowTitles(Win^,ADR(Name),ADDRESS(-1));
             INC(CurrentWindowLeft,WindowWidth);
             IF CurrentWindowLeft + WindowWidth > ScreenWidth THEN
                 CurrentWindowLeft := 0;
                 CurrentWindowTop := ScreenMidPoint;
            END;
        END; (* with *)
    END; (* for *)
(* Create tasks *)
    FOR i := 0 TO NumOfTasks-1 DO
        WITH TaskArray[i] DO
            Sorter := CreateTask(ADR(Name),0,ADR(SorterTask),
                        5000);
            IF Sorter = NIL THEN ExitGracefully(99) END;
        END;
    END;
    WaitForResponses
END Setup;


PROCEDURE SortItAll;
CONST
    PlaceNames = '1st2nd3rd4th5th6th';
VAR
    Places : ARRAY[0..17] OF CHAR;
    i,j    : CARDINAL;
BEGIN
    Places := PlaceNames;
    FOR i := 0 TO NumOfTasks - 1 DO
        WITH TaskArray[i] DO
            FOR j := 7 TO 9 DO
                Name[j] := ' ';
            END;
             SetWindowTitles(Win^,ADR(Name),ADDRESS(-1));
        END; (* with *)
    END;
    GlobalCount := 0;
     ConnectMenu(SecondMenuStrip);
     SignalTasks(SortArray);
    DisconnectMenu;
    FOR i := 0 TO NumOfTasks - 1 DO
        WITH TaskArray[i] DO
            FOR j := 0 TO 2 DO
                IF FinishPlace = ABORTED THEN
                    Name[j+7] := '*'
                ELSE
                    Name[j+7] :=
                        Places[(FinishPlace - 1) * 3 + j]
                END
            END;
             SetWindowTitles(Win^,ADR(Name),ADDRESS(-1));
        END; (* with *)
    END;
END SortItAll;


PROCEDURE ProcessMenu(code : CARDINAL; VAR Quit : BOOLEAN);
BEGIN
    CASE MENUNUM(code) OF
        0 : CASE ITEMNUM(code) OF
                 ItemData : InitializeData(SUBNUM(code))
        |
                 ItemStart: IF ZoomedIn THEN
                                SortItZoomed
                           ELSE
                                SortItAll
                           END
        |
                 ItemQuit : Quit := TRUE
                ELSE
            END (* case *)
        |
        1 : Zoom(ITEMNUM(code))
        ELSE
    END;
END ProcessMenu;


PROCEDURE TheBigLoop;
VAR
    Sig,
    IntuiSig : SignalSet;
    mp       : IntuiMessagePtr;
    class    : IDCMPFlagsSet;
    code     : CARDINAL;
    Stop     : BOOLEAN;
BEGIN
    IntuiSig := SignalSet{};
     INCL(IntuiSig,CARDINAL(MainPort^.mpSigBit));
    Stop := FALSE;
    REPEAT
        Sig := Wait(IntuiSig);
        mp := GetMsg(MainPort^);
        WHILE mp <> NIL DO
            class := mp^.Class;
            code := mp^.Code;
            ReplyMsg(mp);
            IF (MenuPick IN class) AND (code <> MenuNull) THEN
                DisconnectMenu;
                ProcessMenu(code,Stop);
                ConnectMenu(MenuStrip);
            END;
             mp := IntuiMessagePtr(GetMsg(MainPort^));
        END;
    UNTIL Stop;
    SignalTasks(Quit);
END TheBigLoop;


BEGIN
    AddTerminator(Cleanup);
    Setup;
     InitializeData(SubUniqRandom);
    TheBigLoop;
    ExitGracefully(0);
END MultiSort.
```

•AC•

PD Serendipity

Insight into the World of Freely Redistributable Software for the Amiga™

by C.W. Flatte

Will it ever stop? I certainly hope not! This time Fred Fish 179-188! Let's not waste any time...

Fred Fish Disk 179

DietAid V3.1
(Update to FF36)
Diet planning aid to allow the user to compile lists of ingredients (recipes) and automatically compute calorie totals, etc. Binary only. by Terry Gintz

Dmake
Beta release of Matt's version of the UNIX make utility. Features multiple dependancies, wildcard support, and more. Includes source. By Matt Dillion

Excption
Exception is a set of error handling routines that provide a programmer with the ability to easily handle often difficult to implement routines. Routines such as no more memory, file not open, read/write error....etc. V0.6, includes source. By Gerald T Hewes

KickFont
For A-1000 owners, will permanently replace the topaz font on the kickstart disk with a font called "look". Includes a sample in the form of an IFF picture. V3.0, binary only. Also included is Benjamin Fuller's freely redistributable 'SumKick' program. By Greg Browne

Launch
Sample program showing how you can load and execute a program in the workbench environment, then return to the CLI. Includes source. By Peter da Silva

Regexp
A nearly-public-domain reimplementation of the V8 regexp(3) package. Gives C programs the ability to use egrep-style regular expressions, and does it in a much cleaner fashion than the analogous routines in SysV. Includes source. By Henry Spencer

TSnip V1.4a
Very nice "cut and paste" type utility with lots of uses and functions. Features a pop-up intuition control panel, multiple font and color recognition, clipboard and pipe support and a couple of utility programs. Source for support programs only. By John Russell

UnixUtil
A few CLI utilities, including some functionally similiar to the UNIX utilities of the same names. Included are: Wc, Head, Tail, Tee, Detab, Entab, and Trunc. Descriptions are given in the included '.doc' files. By Gary Brant

Fred Fish Disk180

Browser V1.6
(Update to FF134)
A programmer's "Workbench". Allows you to easily and conveniently move, copy, rename, and delete files & directories from a CLI environment. Also provides a method to execute either Workbench or CLI programs. Binary only. By Peter da Silva

GeoTime V1.0
A couple of interesting "clock" type programs based on the "Geochron". Observe the earth's shadow scroll across a map or globe in real-time, based on the system clock. V1.0, binary only, shareware. By Mike Smithwick

GPrint V2.03
A black & white graphics print utility for Epson compatible printers. Command-line options allow several different print qualities and densities. Includes a couple of sample IFF files for printing. V2.03, binary only, shareware. By Peter Cherna

Jed V1.0
A nicely done, intuition-based editor that is quite user-friendly. Features word-wrap, auto-indent, newcli, alt buffer, split-window, keyboard macro, help, printing, and more. V1.0, binary only, shareware. By Dan Burris

NoVirus V1.56
Another Anti-Virus utility. This one features known and new virus detection, view boot block, save and restore bootblocks, several "Install" options and more. Written in assembly. V1.56, binary only. By Nic Wilson

RepString V1.0
Nice little CLI utility to replace any type of string in any type of file with another string of any type. V1.0, binary only, shareware. By Luciano Bertato

TrekTrivia
Very nice mouse-driven trivia type program for Star Trek fans. Contains 100 questions with additional trivia disks available from the author. Binary only, shareware. By George Broussard

(continued)

Fred Fish Disk 181

AMXLISP
Amiga-ized version of the XLisp interpreter originally by David Betz. V2.00, includes source. By David Betz; Amiga work by Francois Rouaix

Bally V0.1
Amiga port of the former arcade game named Click. Lacks sound effects,promised for later updates. V0.1, binary only, shareware. By Oliver Wagner

Tracker V0.0a
Useful debugging routines similar in function but more versatile to those of "MemTrace" on FF163. Will track and report on calls to AllocMem(), FreeMem() [or lack thereof!] among others. V0.0a (Alpha release). By Karl Lehenbaue

Fred Fish Disk 182

AMC V1.0
"Amiga Message Center". Scrolls a message from a text file across the screen on a colorful background. Similar to the "greetings" programs developed by European Amiga enthusiasts. V1.0, binary only. By Foster Hall

Edimap V1.0
A keymap editor. Allows you to read in an existing keymap file, modify it to suit your needs, and save it as a ready-to-use keymap. V1.0, includes source. By Gilles Gamesh

HR136
An IFF file containing a chart showing every possible mixture of the sixteen basic palette colors. Also included are optimized and monochrome palettes along with several tips and techniques for using them with various paint programs. By Dick Bourne

Iconmerger V2.0
Intuition-based program to take any two brush files and merge them into an alternate-image type icon. V2.0, binary only. By Terry Gintz

Sam V1.0
Another IFF sound player with several command-line options. Includes several samples. V1.0, binary only. By Nic Wilson

SetFont V2.5
(Update to FF75)
Allows you to change the system font with various command-line options. Cleans up all known bugs in FF75. V2.5, includes source in C++. By Dave Haynie

Fred Fish Disk 183

FixFd V1.0
A utility for Amiga assembly programmers. FixFd will read a '.FD' file and output a file that can be 'INCLUDE'ed rather than having to link with the colossal 'Amiga.Lib'. V1.0, includes source in assembly. By Peter Wyspianski

Mklib
Another example of building a shared library that evolved from "Elib" FF87. Also included is a library, Edlib, which contains several functions not included in the Manx standard libraries. Includes source. By Edwin Hoogerbeets with C-functions from several different authors.

PCQ V1.0
A subset implementation of a freely-redistributable Pascal compiler. Supports include files, external references, records, enumerated types, pointers, arrays, strings and more. Presently does not support range types, the 'with' statement or sets. V1.0, includes source and sample programs. By Patrick Quaid

Fred Fish Disk 184

BI V1.0
A small brush to to C-code image converter, intended to be used from CLI. V1.0, binary only. By Terry Gintz

CardMaker V1.0
A programmer's aid for creating card image data that can be used in any card game that uses the standard 52 card deck. V1.0, binary only. By Terry Gintz

DPS V1.0
Demo version of a program that will allow you to take any IFF file and save it as a totally self-contained executable file, without the need for any IFF-viewers. V1.0, binary only. By Foster Hall

MouseUtil V1.1
Intuition based program to allow you to change your mouse speed without having to go through preferences. V1.1, includes assembly source. By Luciano Bertato

Print V1.0
Small print utility designed to replace the "copy <filename> to prt:" command. Opens a window displaying the filename being printed, length, and a status bar showing percent completed. Also includes an abort gadget. V1.0, binary only. By Luciano Bertato

VacBench
This amusing little screen hack will "clean up" your WorkBench screen for you when it gets too cluttered! Binary only. By Randy Jouett

World V1.02
A text adventure game similar to the Infocom adventures of Planetfall and Starcross. Quite large with a tremendous variety of responses. V1.02, includes source. By Doug Mcdonald, Amiga port by Eric Kennedy

Fred Fish Disk 185

Commodore IFF
This is a copy of the official November 1988 Commodore IFF disk. All the files in the "documents" directory are in zoo file "documents.zoo"

(continued)

IntuiCommon
A collection of various Intuition-related handy routines.

MSGlobal
Declaration of global constants, type, and variables.

MSMisc
Miscellaneous routines.

MSMenus
Code to set up the menus.

MSData
Handles the collection of the array's data.

MSZoom
Routines used for the zooming feature.

MSSortTask
Contains the sub-tasks' main routine.

MultiSort
The main module.

The code was written in such a way that adding new sorts is trivial. Simply code the sort (with a procedure declaration that will match the ones for the existing sorts) in its own module, making sure that UpdateDisplay is called after every code statement that might alter the value of an array element. Then add a statement to the initialization section of module MSGLobal, calling AddAsort with the appropriate arguments.

Caveat

Because one sort completes before the others does not neccesarily mean that it is better than the rest. It only means that this particular implementation sorted the particular data faster than the other sorts. If you try different implementations of the same sort (there can be some variations on the same theme; the books mentioned below had quite different implementations), you might find that their performance varies greatly.

Suggested Readings

If you're interested in further reading on sorting, here are some books that will send you in the right direction:

Algorithms and Data Structures
by N. Wirth / Prentice-Hall.

Data structure using Pascal
by Tenenbaum & Augenstein / Prentice-Hall.

Algorithms
by Robert Sedgewick / Addison-Wesley.

The Art of Computer Programming
by D.E. Knuth / Addison-Wesley.

Listing One
DEFINITION MODULE IntuiCommon

```
DEFINITION MODULE IntuiCommon;

                 (* * * * * * * * * * * * * * * * * * * * * * *)
                 (* Common Intuition-related routines.        *)
                 (* Originally written for the TDI package,   *)
                 (* but was quickly modified for the Oxxi     *)
                 (* compiler.                                 *)
                 (*                                           *)
                 (* (c) Copyright 1987 by Steve Faiwiszewski. *)
                 (* This program may be freely distributed,   *)
                 (* but it is not to be sold.                 *)
                 (* Please leave this notice intact.          *)
                 (* * * * * * * * * * * * * * * * * * * * * * *)

FROM Rasters   IMPORT DrawModeSet;
FROM Views     IMPORT ViewModesSet;
FROM Intuition IMPORT Border, BorderPtr, Gadget, GadgetPtr,
                          GadgetFlagsSet, RememberPtr,
                          GadgetActivationSet, GadgetTypeSet,
                       Requester, IntuiText, ScreenPtr,
                           IDCMPFlagsSet, WindowFlagsSet, WindowPtr,
                       IntuiTextPtr, Menu, MenuPtr, MenuItem,
                          MenuItemPtr;
FROM SYSTEM    IMPORT BYTE, ADDRESS;

TYPE
    CoordinateType = RECORD
                        Left,
                        Top   : INTEGER;
                     END;

    StandardCoordType = ARRAY [0..4] OF CoordinateType;

VAR
    RKey: RememberPtr;

PROCEDURE ReleaseAllocations;

PROCEDURE InitMenuRec (VAR Amenu : Menu;
                        left, top, width, height : INTEGER;
                        text : ADDRESS) : MenuPtr;
(* Initialize a menu record.      *)

PROCEDURE InitItemRec (VAR mi : MenuItem;
                       left, top,
                           width, height : INTEGER;
                       Cmd : CHAR;
                           ItemFillPtr : ADDRESS) : MenuItemPtr;
(* Initialize an item record.      *)

PROCEDURE InitTextRec (VAR it : IntuiText;
                       left, top : INTEGER;
                       front, back : BYTE;
                           Mode : DrawModeSet;
                       text : ADDRESS) : IntuiTextPtr;
(* Initialize menu text record.    *)


PROCEDURE InitBorder(VAR border : Border;
                     Left, Top : INTEGER;
                     Front, Back,
                     count : BYTE;
                         Mode : DrawModeSet;
                     Coords : ADDRESS;
                     Next : BorderPtr);


PROCEDURE InitReq(VAR requester : Requester;
                  Left, Top : INTEGER;
                  width, height : INTEGER;
                  gadget : GadgetPtr;
                  border : BorderPtr;
                  Text   : IntuiTextPtr;
                  Fill   : BYTE);
(* Initialize a requester *)

PROCEDURE InitCoordEntry(VAR coords : ARRAY OF CoordinateType;
                         offset : CARDINAL;
                         left, top : INTEGER);
(* Initialize coordinates *)

PROCEDURE SetUpSimpleBorder(VAR Coords: ARRAY OF CoordinateType;
                       GadWidth, GadHeight : CARDINAL;
                       VAR border : Border;
                       Left, Top : INTEGER;
                       Front, Back,
                       count : BYTE;
                           Mode : DrawModeSet;
                       NextBorder : BorderPtr);
(* Initialize a border *)

PROCEDURE AllocateStandardBorder(Width, Height : CARDINAL;
                         Front, Back : BYTE;
                              Mode : DrawModeSet): BorderPtr;
(* Create a simple rectangular border *)

PROCEDURE AllocateReqBorder(Width, Height : CARDINAL;
                         Front, Back : BYTE;
                              Mode : DrawModeSet): BorderPtr;
(* Same as AllocateStandardBorder, with minor   *)
(* variation for requesters                     *)

PROCEDURE InitGadget(VAR gadget : Gadget;
                      Left, Top : INTEGER;
                      width, height : INTEGER;
```

(continued)

```
                       flags : GadgetFlagsSet;
                       Activate : GadgetActivationSet;
                       Type : GadgetTypeSet;
                       Render : ADDRESS;
                       Select : ADDRESS;
                       Special: ADDRESS;
                       ID      : CARDINAL;
                       User    : ADDRESS;
                       Text    : IntuiTextPtr) : GadgetPtr;
(* Initialize a gadget *)

PROCEDURE AddGadgetToList(VAR GadList : GadgetPtr;
                           Left, Top : INTEGER;
                           width, height : INTEGER;
                           flags : GadgetFlagsSet;
                           Activate : GadgetActivationSet;
                           Type : GadgetTypeSet;
                           Render : ADDRESS;
                           Select : ADDRESS;
                           Special: ADDRESS;
                           ID      : CARDINAL;
                           User    : ADDRESS;
                           Text    : IntuiTextPtr) : GadgetPtr;
(* Initialize a gadget and add it to a gadget list *)

PROCEDURE OpenSimpleScreen(width,height,depth : CARDINAL;
                        modeset : ViewModesSet;
                            Title : ADDRESS) : ScreenPtr;

PROCEDURE OpenSimpleWindow(width,height,left,top : CARDINAL;
                              title : ADDRESS;
                              flags : WindowFlagsSet;
                              idcmpflags : IDCMPFlagsSet;
                              gadget : GadgetPtr;
                              screen : ScreenPtr) : WindowPtr;


PROCEDURE SetScreenColors(screen : ScreenPtr;
                                data : ARRAY OF CHAR);

END IntuiCommon.
```

Listing Two
IMPLEMENTATION MODULE IntuiCommon

```
IMPLEMENTATION MODULE IntuiCommon;

                 (* * * * * * * * * * * * * * * * * * * * * * *)
                 (* Common Intuition-related routines.        *)
                 (* Originally written for the TDI package,   *)
                 (* but was quickly modified for the Oxxi     *)
                 (* compiler.                                  *)
                 (*                                            *)
                 (* (c) Copyright 1987 by Steve Faiwiszewski. *)
                 (* This program may be freely distributed,   *)
                 (* but it is not to be sold.                  *)
                 (* Please leave this notice intact.           *)
                 (* * * * * * * * * * * * * * * * * * * * * * *)

FROM Termination IMPORT AddTerminator;

FROM Conversions IMPORT ConvStringToNumber;
FROM Strings        IMPORT StringLength;
FROM Rasters     IMPORT DrawModeSet;
FROM ViewsIMPORT ViewModesSet, Hires, Lace, LoadRGB4;
FROM Intuition   IMPORT Border, BorderPtr, Gadget, GadgetPtr,
                            GadgetFlagsSet, CustomScreen,
                            GadgetActivationSet, WBenchScreen,
                            GadgetMutualExcludeSet,
                            GadgetTypeSet, IDCMPFlagsSet,
                            WindowPtr, ScreenPtr, NewWindow,
                            NewScreen, ShowTitle,
                            WindowFlagsSet, OpenWindow, OpenScreen,
                        Requester, IntuiText, MenuEnabled,
                            MenuItemMutualExcludeSet, HighComp,
                        IntuiTextPtr, Menu, MenuPtr, MenuItem,
                        MenuItemPtr, MenuFlagsSet, CommSeq,
                        MenuItemFlagsSet, ItemText, ItemEnabled,
                            RememberPtr, AllocRemember,
                            FreeRemember, InitRequester;
FROM Memory      IMPORT MemReqSet, MemChip, MemPublic;
FROM SYSTEM      IMPORT BYTE, ADDRESS, ADR, TSIZE;


PROCEDURE ReleaseAllocations;
BEGIN
    FreeRemember(RKey, TRUE);
END ReleaseAllocations;

PROCEDURE InitMenuRec (VAR Amenu : Menu;
                        left, top, width, height : INTEGER;
                        text : ADDRESS) : MenuPtr;
(* Initialize a menu record.        *)
BEGIN
    WITH Amenu DO
      NextMenu := NIL;
      LeftEdge := left;    TopEdge := top;
      Width := width;      Height := height;
      Flags := MenuFlagsSet{MenuEnabled};
      MenuName := text;
      FirstItem := NIL
    END;
    RETURN (ADR(Amenu))
END InitMenuRec;

PROCEDURE InitItemRec (VAR mi : MenuItem;
                        left, top,
                             width, height : INTEGER;
                         Cmd : CHAR;
                            ItemFillPtr : ADDRESS) : MenuItemPtr;
(* Initialize an item record.        *)
BEGIN
    WITH mi DO
          NextItem := NIL;
          LeftEdge := left;
          TopEdge := top;
          Width := width;
          Height := height;
          Flags :=
              MenuItemFlagsSet{ItemText, ItemEnabled} + HighComp;
          MutualExclude :=  MenuItemMutualExcludeSet{};
          ItemFill := ItemFillPtr;
          SelectFill := NIL;
          Command := BYTE(Cmd);
          IF Cmd <> 0C THEN
              Flags := Flags + MenuItemFlagsSet{CommSeq}
          END;
          SubItem := NIL;
          NextSelect := 0;
    END;
    RETURN(ADR(mi))
END InitItemRec;

PROCEDURE InitTextRec (VAR it : IntuiText;
                        left, top : INTEGER;
                        front, back : BYTE;
                           Mode : DrawModeSet;
                        text : ADDRESS) : IntuiTextPtr;
(* Initialize menu text record.     *)
BEGIN
    WITH it DO
          FrontPen := front;
        BackPen := back;
          LeftEdge := left;
          TopEdge := top;
          DrawMode := Mode;
          ITextFont := NIL;
          IText := text;
          NextText := NIL
    END;
    RETURN(ADR(it));
END InitTextRec;

PROCEDURE InitBorder(VAR border : Border;
                      Left, Top : INTEGER;
                      Front, Back,
                      count : BYTE;
                         Mode : DrawModeSet;
                      Coords : ADDRESS;
                      Next : BorderPtr);
BEGIN
    WITH border DO
          LeftEdge := Left;
          TopEdge := Top;
          FrontPen := Front;
          BackPen := Back;
          DrawMode := Mode;
          Count := count;
          XY := Coords;
          NextBorder := Next;
    END;
END InitBorder;


PROCEDURE InitGadget(VAR gadget : Gadget;
                       Left, Top : INTEGER;
                       width, height : INTEGER;
                       flags : GadgetFlagsSet;
                       Activate : GadgetActivationSet;
                       Type : GadgetTypeSet;
                       Render : ADDRESS;
                       Select : ADDRESS;
                       Special: ADDRESS;
                       ID      : CARDINAL;
                       User    : ADDRESS;
                       Text    : IntuiTextPtr) : GadgetPtr;
BEGIN
    WITH gadget DO
          NextGadget := NIL;
          LeftEdge := Left;
          TopEdge := Top;
          Width := width; Height := height;
          Flags := flags;
          Activation := Activate;
          GadgetType := Type;
          GadgetRender := Render;
          SelectRender := Select;
          GadgetText := Text;
          MutualExclude := GadgetMutualExcludeSet{};
          SpecialInfo := Special;
          GadgetID := ID; UserData := User
    END;
    RETURN(ADR(gadget));
END InitGadget;

PROCEDURE InitReq(VAR requester : Requester;
                   Left, Top : INTEGER;
                   width, height : INTEGER;
                   gadget : GadgetPtr;
                   border : BorderPtr;
                   Text   : IntuiTextPtr;
                   Fill   : BYTE);
BEGIN
    InitRequester(requester);
    WITH requester DO
          LeftEdge := Left;
          TopEdge := Top;
          Width := width;
          Height := height;
          ReqGadget := gadget;
          ReqText := Text;
          ReqBorder := border;
        BackFill := Fill;
    END;
```

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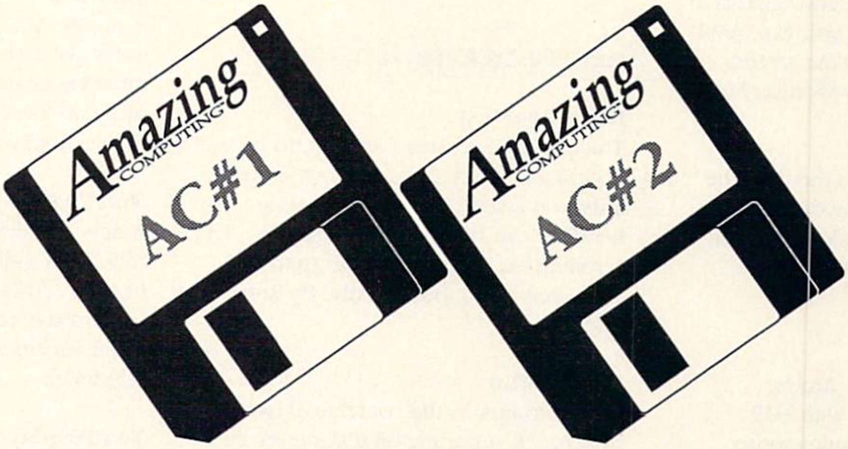

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Fred Fish Disk 186

A68k
A 68000 assembler originally written in Modula-2 in 1985 and converted to C by Charlie Gibb in 1987. Has been converted to accept metacomco-compatible assembler source code and to generate Amiga objects. Includes source. This is V2.42, an update to FF110. By Brian Anderson; C translation and Amiga work By Charlie Gibb

Cards'O'Rama V1.0
A simple game that let's you push your memory. It is played with a deck of 32 cards, grouped in 16 pairs. The cards are shuffled and then displayed at the beginning of each game. Your goal is to pick up as many pairs as you can, until there are no cards left on the screen. V1.0, includes source. By Werther Pirani

Qt2
A cute program that gives the time the way many people actually do, I.E. "it's nearly ten to five". Includes source in assembly. By Charlie Gibb

SimCPM V2.3
(Update to FF109)
A CP/M simulator for the Amiga. Simulates an 8080 along with H19 terminal emulation. Includes source. This is V2.3, an update to FF109. By Jim Cathey; Amiga port by Charlie Gibbs and Willi Kusche

Fred Fish Disk 187

Diskperf
A disk benchmark program which runs on both Unix and the Amiga. This is an update to FF48, with bug fixes and more reliable measurements of the faster read and write speeds available under the new Fast File System. By Rick Spanbauer, enhancements by Joanne Dow

HackLite V1.0.0
This is the latest version the Amiga port of Hack, with lots of Amiga specific enhancements and neat graphics. Now includes an easy to use installation program. This is HackLite V1.0.0, binary only. By Software Distillery

Mackie
A versatile cli/macro-key initiator based on POPCLI with a unique method of "screen-blanking". I won't say more, just try it! V 1.13, includes source. This is an update to FF161. By Tomas Rokicki

SetCPU V1.4
A program designed to allow the user to detect and modify various parameters related to 32 bit CPUs. Includes commands to enable or disable the text/data caches, switch on or off the '030 burst cache line fill request, use the MMU to run a ROM image from 32-bit memory, and to report various parameters when called from a script. V1.4, includes source. By Dave Haynie

Fred Fish Disk 188

BootIntro V1.0
This program creates a small intro on the bootblock of any disk, which will appear after you insert the disk for booting. The headline can be up to 20 characters. The scrolling text portion can be up to 225 characters. V1.0, binary only. By Roger Fischlin

DiffDir V1.0
Diffdir compares the contents of two directories, reporting on differences such as files present in only one directory, different modification dates, file flags, sizes, comments, etc. V1.0, includes source. By Mark Rinfret

ExecDis V1.0
A disassembler comment generator program for the 1.2 Kickstart ROM exec library image. Generates a commented disassembly of the exec library. V1.0, binary only. By Markus Wandel

FastGro V1.0
A fractal program, simulating Diffusion-Limited Aggregation (DLA) as described in the December 1988 Scientific American in the Computer Recreations column. This program is about an order of magnitude faster than the "SLO GRO" program described in Scientific American. V 1.0, includes source. By Doug Houck

FracGen V1.23
(Update to FF142)
A fractal generator program that generates fractal pictures from "seeds" that you create. This is unlike any of the other "fractal generators" I've seen. It can be used to load and display previously created fractal pictures, modify existing fractals, or create your own fractals. V 1.23, binary only, update to FF142. By Doug Houck

MemoryClock
A clock program that shows the amount of free fast ram, free chip ram, as well as the time and date. Includes source in assembly code. By Roger Fischlin

MinRexx
A simple ARexx interface which can be easily patched into almost any program. Includes as an example the freedraw program from FF1. Includes source. By Tomas Rokicki

Null V0.0
A new dos device that behaves like "NIL:" but unlike "NIL:", it is a real handler. This makes it useful in lots of situations where "NIL:" cannot be used. V 0.0, includes source. By Gunnar Nordmark

TextDisplay V1.1
A text display program, like "more" or "less", but about half the size and handles all screen formats (pal/ntsc, interlace/non-interlace, etc). V 1.1, binary only. By Roger Fischlin

That's all for this edition of PD Serendipity. Until next time...

Gotcha!

—C.W. Flatte

Send your PDS Submissions to:

C.W. Flatte
c/o *Amazing Computing*
P.O. Box 869
Fall River, MA 02722

The Amazing Computing Freely Redistributable Software Library
announces the addition of...

New Orleans Commodore Klub's

inNOCKulation Disk

Version 1.5

To help inform Amiga users of the newer Amiga viruses and provide them with the means to detect and eradicate those pesky little critters!

Files and directories on the inNOCKulation Disk include:

Virus_Texts (dir)

Various text files from various places (Amicus #24, PeopleLink, and elsewhere!) describing the Virus(es) and people's experiences and their recommendations; TVSB "The Virus Strikes Back": satirical text describing future efforts to rid the universe of the dreaded (silicon) viruses! Interview with the alleged SCA virus author!

WB_VirusCheckers (dir)

VirusX3.2

Runs in the background and checks disks for viruses or non-standard boot blocks whenever they are inserted. (Recognizes several viruses and non-standard boot blocks. Removes virus in memory. Has a built-in "view boot blocks" & other features.)

Sentry

Revision of VirusX1.01 in Lattice C.

ViewBoot

Highly active mouse-driven disk and memory virus-checker which allows you to look at the pertinent areas (useful in case you supect a NEW virus!)

VRTest3.2

Watches memory for viruses; will alert the user and allow their removal if found. Can check & INSTALL disks, etc.

CLI_VirusCheckers (dir)

AntiVirusII

From The Software Brewery (W. German). Disables a virus in memory.

Clk_Doctor3

Corrects problems with the clock (caused by malignant programs, perhaps not really a "virus") (A500 & A2000)

Guardian1.1

Checks for attempts at viral infection at boot! Allows you to continue with a normal boot (if desired). Includes a small utility program to permanently place the program on a copy of your kickstart disk.

KillVirus

Removes (any?) virus from memory.

VCheck12:

Checks for SCA virus on disk or in memory.

VCheck19

Checks for any virus or otherwise non-standard boot block.

VirusKiller

A graphically appealing and user friendly program by TRISTAR.

Boot-Block_Stuff

SafeBoot2.2

SafeBoot will allow the user to save custom boot sectors of all your commercial disks and save them for such an emergency. If a virus somehow manages to trash the boot sectors of a commercial disk, just run SafeBoot and it will restore the boot sectors, therefore saving your disk!!

Virus_Alert V2.0.1

Yet another anti-virus program with a twist. Once installed on your boot disk a message is displayed just after a warm or cold boot notifying the the user that the disk and memory are virus-free, and forcing a mouse-button press before continuing.

BootBack1

Saves and restores boot-blocks. Runs from CLI only.

Antivirus *aka AVBB*

Includes SEKA assembler source.

XBoot

Converts a boot-block into an executable file, so you may use your favorite debugger (Wack, Dis, ...) to study it.

The inNOCKulation disk also includes icons and arc files.

To order the inNOCKulation disk, send:

$6.00 *includes postage & handling*

($7.00 for non-subscribers)

Amazing Computing
inNOCKulation disk orders
P.O. Box 869
Fall River, MA 02722

The AMICUS & Fred Fish Public Domain Software Library

This software is collected from user groups and electronic bulletin boards around the nation. Each Amicus disk is nearly full, and is fully accessible from the Workbench. If source code is provided for any program, then the executable version is also present. This means that you don't need the C compiler to run these programs. An exception is granted for those programs only of use to people who own a C compiler.

The Fred Fish disk are collected by Mr. Fred Fish, a good and active friend of the Amiga.

Note: Each description line below may include something like 'S-O-E-D', which stands for 'source, object file, executable and documentation'. Any combination of these letters indicates what forms of the program are present. Basic programs are presented entirely in source code format.

AMICUS Disk 1

ABasic programs: Graphics

3DSolids	3d solids modeling prog. w/sample data files
Blocks	draws blocks
Cubes	draws cubes
Durer	draws pictures in the style of Durer
FScape	draws fractal landscapes
Hidden	3D drawing program, w/ hidden line removal
JPad	simple paint program
Optical	draw several optical illusions
PaintBox	simple paint program
Shuttle	draws the Shuttle in 3d wireframe
SpaceArt	graphics demo
Speaker	speech utility
Sphere	draws spheres
Spiral	draws color spirals
ThreeDee	3d function plots
Topography	artificial topography
Wheels	draws circle graphics
Xenos	draws fractal planet landscapes

ABasic programs: Tools

AddressBook	simple database program for addresses
CardFile	simple card file database program
Demo	multiwindow demo
KeyCodes	shows keycodes for a key you press
Menu	run many ABasic programs from a menu
MoreColors	way to get more colors on the screen at once, using aliasing
shapes	simple color shape designer SpeakIt speech and narrator demo

ABasic programs: Games

BrickOut	classic computer brick wall game
Othello	also known as 'go'
Saucer	simple shoot-em-up game
Spelling	simple talking spelling game
ToyBox	selectable graphics demo

ABasic programs: Sounds

Entertainer	plays that tune
HAL9000	pretends it's a real computer
Police	simple police siren sound
SugarPlum	plays "The Dance of the Sugarplum Fairies"

C programs:

ATerm	simple terminal program, S-E
cc	aid to compiling with Lattice C
decvnt	opposite of CONVERT for cross developers
Dotty	source code to the 'dotty window demo
echox	unix-style filename expansion, partial S,O-D
fasterfp	explains use of fast-floating point math
FixDate	fixes future dates on all files on a disk, S-E
freedraw	simple Workbench drawing prog.,S-E
GfxMem	graphic memory usage indicator, S-E
Grep	searches for a given string in a file with
docs.	ham shows off the hold-and-modify method of color generation
IBM2Amiga	fast parallel cable transfers between an IBM and an Amiga
Mandel	Mandelbrot set program, S-E
moire	patterned graphic demo, S-E
objfix	makes Lattice C object file symbols visible to Wack, S-E
quick	quick sort strings routine
raw	example sample window I/O
setlace	turns on interlace mode, S-E
sparks	qix-type graphic demo, S-E

Other executable programs:

SpeechToy	speech demonstration
WhichFont	displays all available fonts

Texts:

68020	describes 68020 speedup board from CSA
Aliases	explains uses of the ASSIGN command
Bugs	known bug list in Lattice C 3.02
CLICard	reference card for AmigaDOS CLI
CLICommands	guide to using the CLI
Commands	shorter guide to AmigaDOS CLI commands
EdCommands	guide to the ED editor
Filenames	AmigaDOS filename wildcard conventions
HalfBright	explains rare graphics chips that can do more colors
ModemPins	description of the serial port pinout
RAMdisks	tips on setting up your RAM: disk
ROMWack	tips on using ROMWack
Sounds	explanation of Instrument demo sound file format
Speed	refutation of Amiga's CPU and custom chip speed
WackCmds	tips on using Wack

AMICUS Disk 2

C programs:

alib	AmigaDOS object library manager , S-E
ar	text file archive program, S-E
fixobj	auto-chops executable files
shell	simple CLI shell, S-E
sq, usq	file compression programs, S-E
YachtC	a familiar game, S-E
Make	a simple 'make' programming utility, S-E
Emacs	an early version of the Amiga text editor, S-E-D

Assembler programs:

bsearch.asm	binary search code
qsort.asm	Unix compatible qsort() function, source and C test program
setjmp.asm	setjmp() code for Lattice 3.02
SVprintf	Unix system V compatible printf()
trees.o	Unix compatible tree() function, O-D

(This disk formerly had IFF specification files and examples. Since this spec is constantly updated, the IFF spec files have been moved to their own disk in the AMICUS collection.)

John Draper Amiga Tutorials:

Animate	describes animation algorithms
Gadgets	tutorial on gadgets
Menus	learn about Intuition menus

AMICUS Disk 3

C programs:

Xref	a C cross-reference gen., S-E
6bitcolor	extra-half-bright chip gfx demo, S-E
Chop	truncate (chop) files down to size, S-E
Cleanup	removes strange characters from text files
CR2LF	converts carriage returns to line feeds in Amiga files, S-E
Error	adds compile errors to a C file, S
Hello	window ex. from the RKM, S
Kermit	generic Kermit implementation, flakey, no terminal mode, S-E
Scales	sound demo plays scales, S-E
SkewB	Rubik cube demo in hi-res colors, S-E

AmigaBasicProgs(dir)

Automata	cellular automata simulation
CrazyEights	card game
Graph	function graphing programs
WitchingHour	a game

ABasiC programs:

Casino	games of poker, blackjack, dice, and craps
Gomoku	also known as 'othello'
Sabotage	sort of an adventure game

Executable programs:

Disassem	a 68000 disassembler, E-D
DpSlide	shows a given set of IFF pictures, E-D
Arrange	a text formatting program, E-D

Assembler programs:

Argoterm	terminal program with speech and Xmodem, S-E

AMICUS Disk 4 **Files from the original Amiga Technical BBS**

Note that some of these files are old, and refer to older versions of the operating system. These files came from the Sun system that served as Amiga technical support HQ for most of 1985. These files do not carry a warranty, and are for educational purposes only. Of course, that's not to say they don't work.

Complete and nearly up-to-date C source to 'image.ed', an early version of the Icon Editor. This is a little flaky, but compiles and runs.

An Intuition demo, in full C source, including files: demomenu.c, demomenu2.c, demoreq.c, getascii.c, idemo.c, idemo.guide, idemo.make, idemoall.h, nodos.c, and txwrite.c

addmem.c	add external memory to the system
bobtest.c	example of BOB use
consoleIO.c	console IO example
creaport.c	create and delete ports
creastdi.c	create standard I/O requests
creatask.c	creating task examples
diskio.c	example of track read and write
dotty.c	source to the 'dotty window' demo
dualplay.c	dual playfield example
flood.c	flood fill example
freemap.c	old version of 'freemap'
geltools.c	tools for VSprites and BOBs
gfxmem.c	graphic memory usage indicator
hello.c	window example from RKM
inputdev.c	adding an input handler to the input stream
joystik.c	reading the joystick
keybd.c	direct keyboard reading
layertes.c	layers examples
mousport.c	test mouse port
ownlib.c,	
ownlib.asm	example of making your own library with Lattice
paratest.c	tests parallel port commands
seritest.c	tests serial port commands
serisamp.c	example of serial port use
prinintr.c	sample printer interface code
prtbase.h	printer device definitions
regintes.c	region test program
setlace.c	source to interlace on/off program
setparallel.c	set the attributes of the parallel port
SetSerial.c	set the attributes (parity, daterabitsport the
singplay.c	single playfield example
speechtoy.c	source to narrator and phonetics demo
timedely.c	simple timer demo
timer.c	exec support timer functions
timrstuf.c	more exec support timer functions
WhichFont.c	loads and displays all available system fonts

process.i and prtbase.i assmebler include files:

autorqstr.txt	warnings of deadlocks with autorequesters
consoleIO.txt	copy of the RKM console I/O chapter
diskfont.txt	warning of disk font loading bug
fullfunc.txt	list of #defines, macros, functions
inputdev.txt	preliminary copy of the input device chapter

License information on Workbench distribution license

printer pre-release copy of the chapter on printer drivers, from RKM 1.1 v11fd.txt 'diff' of .fd file changes from version 1.0 to 1.1 v28v1.diff 'diff' of include file changes from version 28 to 1.0

AMICUS Disk 5 **Files from the Amiga Link / Amiga Information Network**

Note that some of these files are old, and refer to older versions of the operating system. These files are from Amiga Link. For a time, Commodore supported Amiga Link, aka AIN, for online developer technical support. It was only up and running for several weeks. These files do not carry a warranty, and are for educational purposes only. Of course, that's not to say they don't work.

A demo of Intuition menus called 'menudemo', In C source

whereis.c	find a file searching all subdirectories
bobtest.c	BOB programming example
sweep.c	sound synthesis example

Assembler files:

mydev.asm	sample device driver
mylib.asm	sample library example
mylib.i	
mydev.i	
asmsupp.i	
macros.i	assembler include files

Texts:

amigatricks	tips on CLI commands
extdisk	external disk specification
gameport	game port spec
parallel	parallel port spec
serial	serial port spec
v1.1update	list of new features in version 1.1
v1.1h.txt	'diff' of include file changes from version

Files for building your own printer drivers, including dospecial.c, epsondata.c, init.asm, printer.c, printer.link, printertag.asm, render.c, and wait.asm. This disk does contain a number of files describing the IFF specification. These are not the latest and greatest files, but remain here for historical purposes. They include text files and C source examples. The latest IFF spec is elsewhere in this library.

AMICUS Disk 6 **IFF Pictures**

This disk includes the DPSlide program, which can view a given series of IFF pictures, and the 'showpic' program, which can view each file at the click of an icon. The pictures include a screen from ArticFox, a Degas dancer, the guys at Electronic Arts, a gorilla, horses, King Tut, a lighthouse, a screen from Marble Madness, the Bugs Bunny Martian, a still from an old movie, the Dire Straits moving company, a screen from Pinball Contruction Set, a TV newcaster, the PaintCan, a world map, a Porsche, a shuttle mission patch, a tyrannosaurus rex, a planet view, a VISA card, and a ten-speed.

AMICUS Disk 7 **DigiView HAM demo picture disk**

This disk has pictures from the DigiView hold-and-modify video digitizer. It includes the ladies with pencils and lollypops, the young girl, the bulldozer, the horse and buggy, the Byte cover, the dictionary page, the robot and Robert. This includes a program to view each picture separately, and all together as separate, slidable screens. The 'seeilbm' program, to turn any screen into an IFF picture.

AMICUS Disk 8

C programs:

Browse	view text files on a disk, using menus S-E-D
Crunch	removes comments and white space from C files, S-E
IconExec	EXECUTE a series of commands from Workbench S-E
PDScreen Dump	dumps Rastport of highest screen to printer
SetAlternate	sets a second image for an icon, when clicked once S-E
SetWindow	makes windows for a CLI program to run under Workbench S-E
SmallClock	a small digital clockin a window menu bar
Scrimper	the screen printer in the fourth AC S-E

Amiga Basic Programs:

(Note: Many of these programs are present on AMICUS Disk 1. Several of these were converted to Amiga Basic, and are included here.)

AddressBook	a simple address book database
Ball	draws a ball
Cload	program to convert Compuserve hex files to binary, S-D
Clue	the game, Intuition driven
ColorArt	art drawing program
DeluxeDraw	the drawing program in the 3rd AC, S-D
Eliza	conversational computer psychologist
Othello	the game, as known as 'go'
RatMaze	3D ratmaze game
ROR	boggling graphics demo
Shuttle	draws 3D pictures of the space shuttle
Spelling	simple spelling program
YoYo	wierd zero-gravity yo-yo demo, tracks yo-yo to the mouse

Executable programs:

3Dcube	Modula-2 demo of a rotating cube
AltIcon	sets a second icon image, displayed when the icon is clicked
AmigaSpell	a slow but simple spell checker, E-D
arc	the ARC file compression progra must-have for telecom, E-D
Bertrand	graphics demo
disksalvage	prog. to rescue trashed disks, E-D
KwikCopy	a quick but nasty disk copy program: ignores errors, E-D
LibDir	lists hunks in an object file E-D
SaveILBM	saves any screen as IFF pic.E-D ??
ScreenDump	shareware screen dump prog, E only
StarTerm	version 2.0, term program, XmodemE-D

Texts:

LatticeMain	tips on fixing _main.c in Lattice
GDiskDrive	make your own 5 1/4 drive
GuruMed	explains the Guru numbers
Lat3.03bugs	bug list of Lattice C version 3.03
MForgeRev	user's view of the MicroForge HD
PrintSpooler	EXECUTE-based print spool prog.

.BMAP files:

These are the necessary links between Amiga Basic and the system libraries. To take advantage of the Amiga's capabilities in Basic, you need these files. BMAPs are included for 'clist', 'console', 'diskfont', 'exec', 'icon', 'intuition', 'layers', 'mathffp', mathieeedoubas', 'mathieeesingbas', 'mathtrans', 'potgo', 'timer' and 'translator'.

AMICUS Disk 9

Amiga Basic Programs:

FlightSim	simple flight simulator program
HuePalette	explains Hue, Saturation, & Intensity
Requester	ex. of requesters from Amiga Basic
ScrollDemo	demonstrates scrolling capabilities
Synthesizer	sound program
WorldMap	draws a map of the world

Executable programs:

Boing!	latest Boing! demo,with selectable speed,E
Brush2C	converts an IFF brush to C data instructions, initialization code, E
Brush2Icon	converts IFF brush to an icon, E
Dazzle	graphics demo, tracks to mouse, E
DeciGEL	assembler program for stopping 68010 errors, S-E-D
Klock	menu-bar clock and date display, E
life	the game of life, E
TimeSet	Intuition-based way to set the time & date
EMEmacs	another Emacs, more oriented to word processing, S-E-D
MyCLI	a CLI shell, works without the Workbench, S-E-D

Texts:

FnctnKeys	read function keys from Amiga Basic
HackerSln	explains how to win the game 'hacker'
Ist68010	guide to installing a 68010 in your Amiga
Boing!	latest Boing! demo,with selectablespeed, E
Brush2C	converts an IFF brush to C data instructions, initialization code, E
Brush2Icon	converts IFF brush to an icon, E
Dazzle	graphics demo, tracks to mouse, E
DeciGEL	assembler program for stopping 68010 errors, S-E-D
Klock	menu-bar clock and date display, E
life	the game of life, E
TimeSet	Intuition-based way to set the time date,
EMEmacs	another Emacs, more oriented to word processing, S-E-D
MyCLI	a CLI shell, works without the Workbench, S-E-D

Texts:

FnctnKeys	explains how to read function keys from Amiga Basic
HackerSln	explains how to win the game 'hacker'
Ist68010	guide to installing a 68010 in your Amiga
PrinterTip	sending escape sequences to your printer
StartupTip	tips on setting up your startup-sequence file
XfrmrReview	list of Transformer programs that work

Printer Drivers:

Printer drivers for the Canon PJ-1080A, the C Itoh Prowriter, an improved Epson driver that eliminates streaking, the Epson LQ-800, the Gemini Star-10, the NEC 8025A, the Okidata ML-92, the Panasonic KX-P10xx family, and the Smith-Corona D300, with a document describing the installation process.

AMICUS Disk 10 Instrument sound demos

This is an icon-driven demo, circulated to many dealers. It includes the sounds of an acoustic guitar, an alarm, a banjo, a bass guitar, a boink, a calliope, a car horn, claves, water drip, electric guitar, a flute, a harp arpegio, a kickdrum, a marimba, a organ minor chord, people talking, pigs, a pipe organ, a Rhodes piano, a saxophone, a sitar, a snare drum, a steel drum, bells, a vibrophone, a violin, a wailing guitar, a horse whinny, and a whistle.

AMICUS Disk 11

C programs

dirutil	Intuition-based, CLI replacement manager S-E
cpri	shows and adjusts priority of CLI processes, S-E
ps	shows info on CLI processes, S-E
vidtex	displays Compuserve RLE pics, S-E

AmigaBasic programs

pointered	pointer and sprite editor program
optimize	optimization ex ample from AC article
calendar	large, animated calendar, diary and date book program
amortize	loan amortizations
brushtoBOB	converts small IFF brushes to AmigaBasic BOB OBJECTS
grids	draw and play waveforms
hilbert	draws Hilbert curves
madlib	mad lib story generator
mailtalk	talking mailing list program
meadows3D	3D graphics program, from A C™ article
mousetrack	mouse tracking example in hires mode
slot	slot machine game
tictactoe	the game
switch	pachinko-like game
weird	makes strange sounds

Executable programs

cp	unix-like copy command, E
cls	screen clear, S-E
diff	unix-like stream editor uses 'diff' output to fix files
pm	chart recorder performances indicator

Assembler programs

cls	screen clear and CLI arguments example

Modula-2

trails	moving-worm graphics demo
caseconvert	converts Modula-2 keywords to uppercase
Forth	Breshehan circle algorithm example
Analyze	12 templates for the spreadsheet Analyze

There are four programs here that read Commodore 64 picture files. They can translate Koala Pad, Doodle, Print Shop and News Room graphics to IFF format. Getting the files from your C-64 to your Amiga is the hard part.

AMICUS Disk 12

Executable programs

blink	'alink' compatible linker, but faster, E-D
clean	spins the disk for disk cleaners, E-D
epsonset	sends Epson setttings to PAR from menu E-D
showbig	view hi-res pics in low-res superbitmap, E-D
speaktime	tell the time, E-D
undelete	undeletes a file, E-D
cnvapldhm	converts Apple][low, medium and high res pictures to IFF, E-D
menued	menu editor produces C code for menus, E-D
quick	quick disk-to-disk nibble copier, E-D
quickEA	copies Electronic Arts disks, removes protection, E-D
txed 1.3	demo of text editor from Microsmiths,E-D

C programs

spin3	rotating blocks graphics demo, S-E-D
popcli	start a new CLI at the press of a button, like Sidekick, S-E-D
vsprite	VSprite example code from Commodore, S-E-D
AmigaBBS	Amiga Basic bulletin board prog., S-D

Assembler programs

star10	makes star fields like Star Trek intro,S-E-D

Pictures

Mount Mandelbrot	3D view of Mandelbrot set
Star Destroyer	hi-res Star Wars starship
Robot	robot arm grabbing a cylinder

Texts

vendors	Amiga vendors, names, addresses
cardco	fixes to early Cardco memory boards
cinclude	cross-reference to C include files
mindwalker	clues to playing the game well
slideshow	make your own slideshows from the Kaleidoscope disk

AMICUS Disk 13

Amiga Basic programs

Routines from Carolyn Scheppner of CBM Tech Support, to read and display IFF pictures from Amiga Basic. With documentation. Also included is a program to do screen prints in Amiga Basic, and the newest BMAP files, with a corrected ConvertFD program. With example pictures, and the SaveILBM screen capture program.

Routines to load and play FutureSound and IFF sound files from Amiga Basic, by John Foust for Applied Visions. With documentation and C and assembler source for writing your own libraries, and interfacing C to assembler in libraries. With example sound.

Executable programs

gravity	Sci Amer Jan 86 gravitation graphic simulation, S-E-D

Texts

MIDI	make your own MIDI instrument interface, with documentation and a hi-res schematic picture.

AMICUS Disk 14

Several programs from Amazing Computing issues:

Tools

Dan Kary's	C structure index program, S-E-D

Amiga Basic programs:

BMAP Reader	by Tim Jones
IFFBrush2BOB	by Mike Swinger
AutoRequester	example
DOSHelper	Windowed help system for CLI commands, S-E-D
PETrans	translates PET ASCII files to ASCII files, S-E-D
C Squared	Graphics program from Scientific American, Sept 86, S-E-D
crlf	adds or removes carriage returns from files, S-E-D
dpdecode	decrypts Deluxe Paint, remo
ves copy	protection, E-D
queryWB	asks Yes or No from the user returns exit code, S-E
vc	VisiCalc type spreadsheet, no mouse control, E-D
view	views text files with window and
slider	gadget, E-D

Oing, Sproing, yaBoing, Zoing are sprite-based
Boing! style demos, S-E-D

CLIClock, sClock, wClock are window border clocks, S-E-D

Texts

An article on long-persistance phospor monitors, tips on making brushes of odd shapes in Deluxe Paint, and recommendations on icon interfaces from Commodore-Amiga.

AMICUS Disk 15

The C programs include:

'pr'	a file printing utility, which can print files in the background, and with line numbers and control character filtering.
'fm'	displays a chart of the blocks allocated on a disk.
'Ask'	questions an 'execute' file, returns an error code to control the execution in that batch file
'Stat'	an enhanced version of AmigaDOS 'status' command.
'Dissolve'	random-dot dissolve demo displays IFF picture slowly, dot by dot, in a random fashion.
'PopCLI2'	invoke new CLI window at the press of a key.

The executable programs include:

'Form'	file formatting program through the printer driver to select print styles
'DiskCat'	catalogs disks, maintains, sorts,merges lists of disk files
'PSound'	SunRize Industries' sampled sound editor & recorder
'Iconmaker'	makes icons for most programs
'Fractals'	draws great fractal seascapes and mountain scapes.
'3D Breakout'	3D glasses, create breakout in a new dimension
'AmigaMonitor'	displays lists of open files,
memory use,	tasks, devices and ports in use.
'Cosmoroids'	version of 'asteroids' for the Amiga.
'Sizzlers'	high resolution graphics demo written in Modula 2.

Texts:

'ansi.txt'	explains escape sequences the CON: device responds to.
'FKey'	includes template for making paper to sit in the tray at the top of the Amiga keyboard.
'Spawn'	programmer's document from Commodore

Amiga, describs ways to use the Amiga's multitasking capabilities in your own programs.

AmigaBasic programs:

'Grids'	draw sound waveforms, and hear them played.
'Light'	a version of the Tron light-cycle video game.
'MigaSol'	a game of solitaire.
'Stats'	program to calculate batting averages
'Money'	"try to grab all the bags of money that you can."

AMICUS 15 also includes two beautiful IFF pictures, of the enemy walkers from the ice planet in Star Wars, and a picture of a cheetah.

AMICUS Disk 16

'juggler' demo by Eric Graham. a robot juggler bouncing three mirrored balls, with sound effects. Twenty-four frames of HAM animation are flipped quickly to produce this image. You control the speed of the juggling. The author's documentation hints that this program might someday be available as a product.

IFF pictures

parodies of the covers of Amiga World and Amazing Computing magazines.

C programs:

'Inputhandler'	example of making an input handler.
'FileZap3'	binary file editing program
'ShowPrint'	displays IFF picture, and prints it.
'Gen'	program indexes and retrieves C structures and variables declared in the Amiga include file system.

Executable Programs:

'FixHunk2'	repairs an executable program file for expanded memory
'ms2smus'	converts Music Studio files to IFF standard 'SMUS' format. I have heard this program might have a few bugs, especially in regards to very long songs, but it works in most cases.
'Missile'	Amiga version of the 'Missile Command' video game,

This disk also contains several files of scenarios for Amiga Flight Simulator II. By putting one of these seven files on a blank disk, and inserting it in the drive after performing a special command in this game, a number of interesting locations are preset into the Flight Simulator program. For example, one scenario places your plane on Alcatraz, while another puts you in Central Park

AMICUS Disk 17

Telcommunications disk whuch contains six terminal programs.

"Comm" V1.33	term prog. with Xmodem, WXmodem,
"ATerm" V7.2	term prog. includes Super Kermit
"VT-100"V2.6	Dave Wecker's VT-100 emulator with Xmodem,Kermit, and scripting
"Amiga Kermit"	V4D(060) port of the Unix C-Kermit
"VTek" V2.3.1	Tektronix graphics terminal emulator based on the VT-100 prog. V2.3 and contains latest 'arc' file compression
"AmigaHost"	V0.9 for Compuserve. Includes RLE graphics abilities & CIS-B file transfer protocol.
"FixHunk"	expansion memory necessity
"FixObj"	removes garbage characters from modem received files
"Txt"	filters text files from other systems to be read by the Amiga E.C.
"addmem"	executeable version for use with mem expansion article in AC v2..1
'arc'	file documentation and a basic tutorial on un 'arc'ing files
"arcre"	for makeing "arc" files E.C.

AMICUS Disk 18

Logo	Amiga version of the populacomputer language, with example programs, E-D
Tv*Text	Demo version of the TV*Text character generator
PageSetter	Freely distributable versions of the updated PagePrint and PageIFF programs for the PageSetter desktop publishing package.
FullWindow	Resizes any CLI window using only CLI commands, E-D
Life3d	3-D version of Conway's LIFE program, E-D
Defdisk	CLI utility to re-assign a new Workbench disk, S-E-D
Calendar.WKS	Lotus-compatible worksheet that makes calendars
SetKey	Demo of keyboard key re-programmer, with IFF picture to make function key labels, E-D
VPG	Video pattern generator for aligning monitors, E-D
HP-10C	Hewlett-Packard-like calculator, E-D
SetPrefs	Change the Preferences settings on the fly, in C, S-E-D
StarProbe	Program studies stellar evolution. C source included for Amiga and MS-DOS, S-E-D
ROT	C version of Colin French's AmigaBasic ROT program from Amazing Computing. ROT edits and displays polygons to create three dimensional objects. Up to 24 frames of animation can be created and displayed. E-D
Scat	Like Ing, windows on screen run away from the mouse, E-D
DK	Decays" the CLI window into dust, in Modula 2, S-E-D
DropShadow2	Adds layered shadows to Workbench windows, E-D

AMICUS Disk 19

This disk carries several programs from Amazing Computing. The IFF pictures on this disk include the Amiga Wake part T-shirt logo, a sixteen-color hi-res image of Andy Griffith, and five Amiga Live! pictures from the Amazing Stories episode that featured the Amiga.

Solve	Linear equation solver in assembly language, S-E-D
Gadgets	Bryan Catley's AmigaBasic Tutorial,
Household	Bryan Catley's AmigaBasic household inventory program, S-D
Waveform	Jim Shields' Waveform Workshop AmigaBasic, S-D
DiskLib	John Kennan's AmigaBasic disk librarian program, S-D
Subscripts	Ivan Smith's AmigaBasic subscript example, S-D
String, Boolean	C programs and executables for Harriet Maybeck Tolly's Intuition tutorials, S-E-D
Skinny C	Bob Riemersma's example for making small C programs, S-E-D
COMAL.h	Make C look like COMAL header file,
EmacsKey	Makes Emacs function key definitions by Greg Douglas, S-D
AMon 1.1	Snoop on system resource use, E-D
BTE	Bard's Tale character editor, E-D
Size	CLI program shows the size of a given set of files, E-D
WinSize	CLI window utility resizes current window, S-E-D

AMICUS Disk 20

Compactor, Decoder Steve Michel AmigaBasic tools, S-D

BobEd	BOB and sprite editor written in C,S-E-D
SpriteMasterII	Sprite editor and animator by Brad Kiefer, E-D
BlitLab	Blitter chip exploration C program by Tomas Rokicki, S-E-D
FPic	Image processing program by Bob Bush loads and saves IFF images, changes them with several techniques, E-D
Bankn	Complete home banking program, balance your checkbook! E-D

AMICUS Disk 21

Target	Makes each mouse click sound like a gunshot, S-E-D
Sand	Simple game of sand that follows the mouse pointer, E-D
PropGadget	Harriet Maybeck Tolly's proportional gadget example, S-E
EHB	Checks to see if you have extra-half-bright graphics, S-E-D
Piano	Simple piano sound program
CelScripts	Makes cel animation scripts for Aegis Animator, in AmigaBasic

This disk has electronic catalogs for AMICUS disks 1 to 20 and Fish disks 1 to 80. They are viewed with the DiskCat program, included here.

AMICUS Disk 22

Cycles	Light cycle game, E-D
Show_PrintII	Views and prints IFF pictures, including larger than screen
PrtDrvGen2.3	Latest version of a printer driver generator
Animations	VideoScape animations of planes and boing ball
Garden	Makes fractal gardenscapes
BasicSorts	Examples of binary search and insertion sort in AmigaBasic

AMICUS Disk 23

An AMICUS disk	completely dedicated to music on the Amiga. This disk contains two music players, songs, instruments, and players to bring the thrill of playing "Big Sound" on your Amiga
Instruments	a collection of 25 instruments for playing and creating music. The collection ranges from Cannon to Marimba
List INSTR	program to list the instruments DMCS will not load as well as list the origins for any instrument.
Music	a collection of 14 Classical pieces
1812Overture	The 16 minute classical feature complete with Cannon!

Three Amiga Music Players:

- SMUSPlay
- MusicCraft2SMUS
- MusicStudio2SMUS

AMICUS Disk 24

Sectorama	A disk sector editor for any AmigaDOS file-structured device, recover files from a trashed hard disk. By David Joiner of MicroIllusions
Iconize	Reduces the size of IFF images, companion program, Recolor, remaps the palette colors of one picture to use the palette colors of another. Using these programs and a tool to convert IFF brushes to Workbench icons, make icons look like miniatures of the pictures.
CodeDemo	Modula-2 program converts assembler object files to inline CODE statements. Comes with a screen scrolling example
AmiBug	Workbench hack makes the same fly walk across the screen at random intervals. Otherwise, completely harmless.
BNTools	Three examples of assembly language code from Bryce Nesbitt: 1. SetLace,prog to switch interlace on&off. 2. Why, replace AmigaDOS CLI Why 3. LoadIt, prog to load a file into memory until a reboot. (Only the most esoteric hackers will find LoadIt useful.)
Monolace	CLI program resets Preferences to several colors of monochrome & interlace screens. C source is included, works with DisplayPref, a CLI program which displays the current Preferences settings.
BoingMachine	A ray-traced animation of a perpetual motion Boing-making machine, includes the latest version of the Movie program, which has the ability to play sounds along with the animation. By Ken Offer
Daisy	Example of using the translator and narrator devices to make the Amiga talk. It is written in C.
QuickFlix	Script-driven animation and slideshow program flips through IFF images.
BMon	System monitor AmigaBasic program ; perform simple manipulations of memory.
Moose	Random background program, a small window opens with a moose resembleing Bullwinklesaying witty phrases user definable.
DGCS	Deluxe Grocery Construction Set, simple Intuition-based prog for assembling and printing a grocery list.
The Virus Check	directory holds several programs relating to the software virus that came to the US from pirates in Europe as detailed in Amazing Computing V2.12. Bill Koester's full explanation of the virus code is included. One program checks for the software virus on a Workbench disk; the second program checks for the virus in memory, which could infect other disks.

AMICUS Disk 25

Nemesis	Graphics demo pans through space towards the mythical dark twin of the sun with wonderful music and space graphics.
The KickPlay	directory holds text that describes several patches to the Kickstart disk. For Amiga 1000 hackers who feel comfortable patching a disk in hexadecimal, KickPlay offers the chance to automatically do an ADDMEM for old expansion memory, as well as the ability to change the picture of the "Insert Workbench" hand. A program is also included for restoring the correct checksum of the Kickstart disk.
KeyBird	BASIC prog edits keymaps, adjust the Workbench keymaps or create your own.

8ColorWB	Modifies the Workbench so three bitplanes are used, icons can have eight colors, instead of four, eight-color icons are included. Public domain program "zapicon" or "brush2icon" converts eight-color IFF brushes to icons, to use Deluxe Paint to make icons for this new Workbench.
BrushIcon	Converts brushes to icons (bizarr docs).
Egraph	Graphing prog reads [x,y] values from a file and displays them on the screen, similar to the same-named Unix program.
Keep 1.1	Message-managing program for telecommunications, lets you save messages from an online transcript to another file, understands the message format of the national networks and several types of bulletin board software. Moves through the transcript and save messages
Kill.fastdir	Speed up directory access, it creates a small file in each directory on a disk which contains the information about the files, will also remove all the "fastdir" files from each directory. by CLImate's authors

The LaceWB program changes between interlace and non-interlace Workbench. Previously, you were forced to reboot after changing Preferences to an interlaced screen. This program flips between the normal and extended screen heights.

PW_Utility	A shareware utility for ProWrite users, changes margin settings and font types.
Guru	A CLI program, prints out probable causes for Guru mediations; C source included.
DiskWipe	Latest from Software Distillery, removes files from directories or disk drives, much faster than "delete."
Snow	AmigaBasic makes snowflake designs.
Mlist	Mailing list database.
Softballstats	Maintain softball statistics/ team records.
Dodge	Short Modula-2 program moves the Workbench screen around after a period of time, prevents monitor burn-in.

AMICUS Disk 26

Todor Fay's SoundScape module code from his Amazing Computing articles. The source to Echo, Chord, TX, and VU is included. The Lattice and Manx C source code is here, along with the executable modules.

Claz2	Update of prog to convert IFF images to PostScript files for printing on laser printers
SDBackup	Hard disk backup prog with Lempel-Ziv compression to reduce the necessary number of disks.
TCB	Prints information about tasks and processes in the system; assembler source is included.
FunBut	Lets a function key act like a rapid series of left mouse button events.
DC	A handy program for people who use an Amiga 1020 5 1/4 inch drive as an AmigaDOS floppy. A Workbench program that sends a DiskChange signal to the operating system: instead of typing "diskchange df2:" over and over again, just click on the icon. C source included.
System config	File makes screen 80 columns wide of text in the Scribble! word processor.
Dick2Ram	2 programs to move the Scribble! spelling dictionary to and from the RAM disk.
Lexical	Analyzes a text file and gives the Gunning-Fog, Flesch, and Kincaid indices which measure readability.
HexDump	Modula-2 program to display memory locations in hexadecimal.
Tartan	AmigaBasic; design Tartan plaids.
DirMaster	Disk catalog program.
BMP	plays 8SVX sampled sounds in the background while something else is happening in the Amiga, as your Amiga is booting, for example.
ShowPt	CLI program changes your pointer to a given pointer.

AMICUS 26 also has a collection of mouse pointers, & Workbench program to display them

Fred Fish Public Domain Software

Fred Fish Disk 1:

amigademo	Graphical benchmark for comparing amigas.
amigaterm	simple communications program with Xmodem
balls	simulation of the "kinetic thingy" with balls on strings
colorful	Shows off use of hold-and-modify mode.
dhrystone	Dhrystone benchmark program.
dotty	Source to the "dotty window" demo on the Workbench disk.
freedraw	A small "paint" type program with lines, boxes, etc.
gad	John Draper's Gadget tutorial program
gfxmem	Graphical memory usage display prog.
halfbrite	demonstrates "Extra-Half-Brite" mode, if you have it
hello	simple window demo
latffp	accessing the Motorola Fast Floating Point library from C
palette	Sample prog. to design color palettes.
trackdisk	Demonstrates use of the trackdisk driver.
requesters	John Draper's requester tutorial and example program.
speech	Sample speech demo program. Stripped down "speechtoy".
speechtoy	Another speech demo program.

Fred Fish Disk 2:

alib	Object module librarian.
cc	Unix-like frontend for Lattice C compiler.
dbug	Macro based C debugging package. Machine independent.
make	Subset of Unix make command.
make2	Another make subset command.
microemacs	Small version of emacs editor, with macros, no extensions
portar	Portable file archiver.
xrf	DECUS C cross reference utility.

Fred Fish Disk 3:

gothic	Gothic font banner printer.
roff	A "roff" type text formatter.
ff	A very fast text formatter
cforth	A highly portable forth implementation. Lots of goodies.
xlisp	Xlisp 1.4, not working correctly.

Fred Fish Disk 4:

banner	Prints horizontal banner
bgrep	A Boyer-Moore grep-like utility
bison	CNU Unix replacement 'yacc', not working.
bm	Another Boyer-Moore grep-like utility
grep	DECUS grep
kermit	simple portable Kermit with no connect mode.
MyCLI	Replacement CLI for the Amiga. V. 1.0
mandel	A Mandelbrot set program, by Robert French and RJ Mical

Fred Fish Disk 5

cons	Console device demo program with supporting macro routines.
freemap	Creates a visual diagram of free memory
input.dev	sample input handler, t raps key or mouse events
joystick	Shows how to set up the gameport device as a joystick.
keyboard	demonstrates direct communications with the keyboard.
layers	Shows use of the layers library
mandelbrot	IFF Mandelbrot program
mouse	hooks up mouse to right joystick port
one.window	console window demo
parallel	Demonstrates access to the parallel port.
printer	opening and using the printer, does a screen dump, not working
print.support	Printer support routines, not working.
proctest	sample process creation code, not working
region	demos split drawing regions
samplefont	sample font with info on creating your own
serial	Demos the serial port
singlePlayfield	Creates 320 x 200 playfield
speechtoy	latest version of cute speech demo
speech.demo	simplified version of speechtoy, with IO requests
text.demo	displays available fonts
timer	demos timer.device use
trackdisk	demos trakcdisk driver

Fred Fish Disk 6:

compress	like Unix compress, a file squeezer
dadc	analog clock impersonator
microemacs	upgraded version of microemacs from disk 2
mult	removes multiple occuring lines in files
scales	demos using sound and audio functions
setparallel	Allows changing parallel port parameters
setserial	Allows changing serial port parameters.
sortc	quicksort based sort program, in C
stripc	Strips comments and extra whitespace from C source

Fred Fish Disk 7:

This disk contains the executables of the game Hack V 1.0.1.

Fred Fish Disk 8:

This disk contains the C source to Hack on disk 7.

Fred Fish Disk 9:

moire	Draws moire patterns in black and white
MVP-FORTH	Mountain View Press Forth, version 1.00.03A. A shareware version of FORTH from Fantasia Systems.
proff	a more powerful text formatting program
setlace	Prog to toggle interlace mode on and off
skewb	a rubic's cube type demo
sparks	moving snake Graphics demo

Fred Fish Disk 10:

conquest	An interstellar adventure simulation game
dehex	convert a hex file to binary
filezap	Patch program for any type of file.
fixobj	Strip garbage off Xmodem transferred files.
iff	Routines to read and write iff format files.
ld	simple directory program
ls	Minimal UNIX ls, with Unix-style wildcarding, in C
sq,usq	file squeeze and unsqueeze
trek73	Star Trek game
yachtc	Dice game.

Fred Fish Disk 11:

dpslide	slide show program for displaying IFF images with miscellaneous pictures

Fred Fish Disk 12:

amiga3d	Shows a rotating 3 dimensional solid "Amiga sign".
ArgoTerm	a terminal emulator program, written in assembler
arrow3d	Shows a rotating 3 dimensional wire frame arrow.
ld4	directory listing program
IconExec	
SetWindow	two progs for launching progs from Workbench, presently only works under CLI.
SetAlternate	Makes an icon show a second image when clicked once
StarTerm	terminal emulator, with ASCII Xmodem, dialer, more.

Fred Fish Disk 13:

A Bundle of Basic programs, including:

Jpad	toybox	ezspeak	mandlebrot
xmodem	3dsolids	addbook	algebra
ror	amgseq1	amiga-copy	band
bounce	box	brickout	canvas
cardfi	circle	colorcircles	Copy
cubes1	cutpaste	datedogstar	
dragon	draw	dynamictriangle	
Eliza	ezterm	fillibuster	fractal
fscape	gomoku	dart	haiku
hal9000	halley	hauntedM	hidden
join	loz	mandel	menu
minipaint	mouse	Orthello	patch
pena	pinwheel	gboxrandom-circles	
Readme	rgb	rgbtest	Rord
sabotage	salestalk	shades	shapes
shuttle			
sketchpad	spaceart	speakspeach	
speecheasy	spell	sphere	
spiral	striper	superpad	suprshr
talk	terminal		
termtest	tom	topography	triangle
wheels	xenos	xmostriper	

(note: some programs are Abasic, most are Amigabasic, and some programs are presented in both languages)

Fred Fish Disk 14:

amiga3d	update of #12, includes C source to a full hidden surface removal and 3D graphics
beep	Source for a function that generates a beep sound
dex	extracts text from within C source files
dimensions	demonstrates N dimensional graphics
filezap	update of disk 10, a file patch utility
gfxmem	update of disk 1, graphic memory usage indicator
gi	converts IFF brush files to Image struct, in C text.
pdterm	simple ANSI VT100 terminal emulator, in 80 x 25 screen
shell	simple Unix 'csh' style shell
termcap	mostly Unix compatible 'termcap' implementation.

Fred Fish Disk 15:

Blobs	graphics demo, like Unix 'worms'
Clock	simple digital clock program for the title bar
Dazzle	An eight-fold symmetry dazzler program. Really pretty!
Fish	double buffered sequence cycle animation of a fish
Monopoly	A really nice monopoly game written in AbasiC.
OkidataDump	Okidata ML92 driver and WorkBench screen dump program.
Polydraw	A drawing program written in AbasiC.
Polyfractals	A fractal program written in AbasiC.

Fred Fish Disk 16:

A complete copy of the latest developer IFF disk

Fred Fish Disk 17:

The NewTek Digi-View video digitizer HAM demo disk

Fred Fish Disk 18:

AmigaDisplay	dumb terminal program with bell, selectable fonts
Ash	Prerelease C Shell-like shell program, history, loops, etc.
Browser	wanders a file tree, displays files, all with the mouse
MC68010	docs on upgrading your Amiga to use a MC68010
Multidim	rotate an N dimensional cube with a joystick
PigLatin	SAY command that talks in Pig Latin
Scrimper	Screen image printer
Xlisp1.6	source, docs, and execut for a Lisp interpret.

Fred Fish Disk 19:

BlackJack	text-oriented blackjack game
JayMinerSlides	Slides by Jay Miner, Amiga graphics chip designer, showing flowchart of the Amiga internals, in 640 x 400.
Keymap_Test	test program to test the key mapping routines
LockMon	Find unclosed file locks, for programs that don't clean up.

Fred Fish Disk 20:

AmigaToAtari	converts Amiga object code to Atari form
DiskSalv	program to recover files from a trashed AmigaDOS disk.
Hash	example of the AmigaDOS disk hashing function
Hd	Hex dump utility ala Computer Language magazine, April 86
MandelBrots	Mandelbrot contest winners
MultiTasking	Tutorial and examples for Exec level multitasking
Pack	strips whitespace from C source
PortHandler	sample Port-Handler program that performs. Shows BCPL environment
Random	Random number generator in assembly, f or C or assembler.
SetMouse2	sets the mouse port to right or left
SpeechTerm	terminal Emulator with speech capabilities, XModem
TxEd	Demo editor from Microsmith's Charlie Heath

Fred Fish Disk 21

This is a copy of Thomas Wilcox's Mandelbrot Set Explorer disk. Very good!

Fred Fish Disk 22

This disk contains two new "strains" of microemacs.

Lemacs	version 3.6 by Daniel Lawrence. For Unix V7, BSD 4.2, Amiga, MS-DOS, VMS. Uses Amiga function keys, status line, execute, startup files, more.
Pemacs	By Andy Poggio. New features include <ALT> keys as Meta keys, mouse support, higher priority, backup files, word wrap, function keys.

Fred Fish Disk 23

Disk of source for MicroEmacs, several versions for most popular operating systems on micros and mainframes. For people who want to port MicroEmacs to their favorite machine.

Fred Fish Disk 24:

Conques	interstaller adventure simulation game
Csh	update to shell on Disk 14, with built in commands,named variables substitution.
Modula-2	A pre-release version of the single pass Modula-2 compiler originally developed for Macintosh at ETHZ. This code was transmitted to the AMIGA and is executed on the AMIGA with a special loader. Binary only.

Fred Fish Disk 25

Graphic Hack	A graphic version of the game on disks 7 and 8 This is the graphics-oriented Hack game by John Toebes. Only the executable is present.

Fred Fish Disk 26

UnHunk	Processes the Amiga "hunk" loadfiles. Collect code, data, and bss hunks together, allows individual specificatio of code, data, and bss origins, and generates binary file with format reminiscent of Unix "a.out" format. The output file can be easily processed by a separate program to produce Motorola "S-records" suitable for downloading to PROM programmer. By Eric Black.
C-kermit	Port of the Kermit file transfer program and server.
Ps	Display and set process priorities
Archx	Yet another program for bundling up text files and mailing or posting them as a single file unit.

Fred Fish Disk 27

ABdemos	Amiga Basic demos; Caroly Scheppner.
NewConvertFD	creates .bmaps from fd files.
BitPlanes	finds addresses of and writes to bitplanes of the screen's bitmap.
AboutBmaps	A tutorial on creation and use of bmaps.
LoadILBM	loads and displays IFF ILBM pics.
LoadACBM	loads and displays ACBM pics.
ScreenPrint	creates a demo screen and dumps it to a graphic printer.
Disassem	Simple 68000 disassembler. Reads standard Amiga object files and disassembles the code sections. Data sections are dumped in hex. The actual disassember routines are set up to be callable from a user prog so instructions in memory can be disassembled dynamically. By Bill Rogers.
DvorakKeymap	Example of a keymap structure for the Dvorak keyboard layout. Untested but included because assembly examples are few and far between. By Robert Burns
Hypocycloids	Spirograph, from Feb. 84 Byte.
LinesDemo	Example of proportional gadgets to scroll a SuperBitMap.
MemExpansion	Schematics and directions for building your own homebrew 1 Mb memory expansion, by Michael Fellinger.
SafeMalloc	Program to debug 'malloc()' calls
ScienceDemos	Convert Julian to solar and sidereal time, stellar positions and radial velocity epoch calculations and Galilean satellite plotter. By David Eagle.

Fred Fish Disk 28

ABasic games by David Addison: Backgammon , Cribbage, Milestone, and Othello

Cpp	DECUS 'cpp' C preprocessor, & a modified 'cc' that knows about the 'cpp', for Manx C.
Shar	Unix-compatible shell archiver, for packing files for travel.
SuperBitMap	Example of using a ScrollLayer, syncing SuperBitMaps for printing, and creating dummy RastPorts.

Attention

Due to the increasing size of the Fred Fish library, some portions of the directory have been excluded in this issue. New disks are detailed, of course, but, for a complete listing, please refer to our Amazing Computing Product Guide Spring '89 available at your local Amazing Dealer

Continued from Fred Fish Disk 157

BootBack	A handy little utility to copy and save the boot block from a disk, then later restore it should the disk get stomped on by some ugly virus. Source. by: David Joiner
ECPM	A CP/M emulator for the Amiga.Emulates an 8080 along with H19 terminal emulation. Update from version on disk number 109.Source.by: Jim Cathey; port by Charlie Gibbs; Significant improvements by Willi Kusche
KeyFiler	BBS message file sorter that allows sorting by keyword. Includes a textreader, Soundex matching, and limited wildcardcapabilities. V. 1.0, Binary only.by: J. Motsinger
ScreenZap	A little utility to clean away screens that are left by illbehaving programs. It will kill every screen behind the WorkBench, noting how many it gets. The screens in front of WB are not affected. Source. by: Lars Clausen
SetPrefs	Allows you to build a whole library of preference settings and instantly switch back and forth between them. Affects allpreference settings not just the colors. Very useful for machines with multiple users or multiple external devices. Includes Amiga's default and various sample preference settings. B only. by: Martin Hippele
Xicon	Xicon lets you use icons to call up scripts containing CLI commands. This is version 2.01, an update to FF102. Includes source. by: Pete Goodeve

Fred Fish Disk 158

DiskX	Nicely done Sector-based disk editor. Binary only by: Steve Tibbett
MemBoardTest	Originally designed for production testing of A1000 memory boards. Very nice intuition interface. Version 2.4, Source in Modula by: George Vokalek
MSDOS	A program to list files written in standard MS-Dos orAtari ST format. The files can then be copied to Ram and rewritten to disk in Amiga-Dos format. Binary only, Shareware, V. 0.1.Author: Frank Wjbbeling
PCBTool	Early version of a shareware PC Board layout program Lots of options including variable size pads and traces, grids, grid snap, layers, zoom, selectable centering, text and more. This version does not support printer/ plotter dumps or libraries. V.2.6, B only .by: George Vokalek
ScreenX	A handy little background utility that provides a small clock/memory counter in its inactive mode and a versatile screen manipulator when called upon. Binary, source available from author, V2.1.by: Steve Tibbett
TaskX	A "real-time" task editor. Lets you list and set priorities of all currently running tasks. Binary , V. 2.0. by: S. Tibbett
VirusX	Update to FF154, checks for a couple of additional new strains. Includes source V. 1.6.by: Steve Tibbett
YachtC3	Update to FF10, contains some fixes and incorporates a simple sound process. V3, includes source. Author: Sheldon Leemon, with enhancements by MarkSchretien

Fred Fish Disk 159

Free	A little command to put in your c directory that returns memory status and number of tasks currently served by EXEC Includes source. by: Joerg Anslik
MidiTools	A group of several different utility programs for those who run a Midi system. Binary only. by: Jack Deckard
StarChart	Nicely done Intuition based program to display and identify about 600 stars, galaxies and nebulae visible in the Northern hemisphere. V.1.2, Source. by: Ray R. Larson
TaskControl	Nicely done task-handling program allowing you to put to sleep, kill or change priorities of the all the currently loaded tasks.Also potentially GURU-producing, so be careful what tasks you kill, change priorities of, etc. Handy windowizer will reduce it almostto an icon Binary only.by: J. Martin Hippele
TUC	"The Ultimate Clock". Another window title clock/memory minder. This one is in 132 columns! Also gives the free memory on drives DF0, DF1 & DF2.Includes source. by:Joerg Anslik

Fred Fish Disk 160

Calls	A little utility to help analyze the flow of a C-program by laying out the functions called in a hierarchical manner.Originally from Usenet with major revisions by Kevin Braunsdorf, Amiga portby George MacDonald
Check	A useful little utility for finding structural errors in C-source code. Many command-line options. V.1.03, binary only.by: Keith Elbertson
Dis	A 68000 disassembler, written in assembly, this is an update to the version on disk #128. Includes source by: Greg Lee with enhancements by Willi Kusche
DMouse	A versatile screen & mouse blanker, auto window activator, mouse accelerator, popcli, pop window to front, push window to back, etc, widget. V. 1.09, includes source Update to FF 145 by: Matt Dillon
DWIP	"Daisy Wheel IFF Printer". A graphics printing utility that allows the printing of IFF pictures on a daisy wheel printer. Includes source. by: Ken Van Camp
M4	A UNIX M4 look-alike macro processor intended as a front end Ratfor, Pascal, and other languages that do not have a built-in macro processing capability. Pd M4 reads standard input, the processed text is written on the standard output. by: Ozan S. Yigit (oz)
MemoPad	A shareware intuition-based memo reminder program.Nicely done. Update to version on disk #146, v .2, binary only.by: Michael Griebling
NeuralNets	A neural network example using the general-ized back-propagation delta rule for learning, specifically applied to the tabularasa Little Red Riding Hood instance. by: J. C. Hoskins

Fred Fish Disk 161

Friends	Sscreen hack with command-line options to keep your mouse pointer company when you step away. Source by: Michael Warner
Getsprite	Simple little program to convert Dpaint brushes into C-sourceBinary only. by: Michael Warner
IncRev	A handy little program that will automatically increment the revision number of a program every time it is recompiled.Binary only. by: Bryan Ford
LGZ	A Map generator/editor for the LGZ game. Not useful if you don't happen to play that game, but good source example of intuition interfacing. V.0.1 by: Lars & Henrik Clausen
Mackie	A versatile cli/macro-key initiator based on POPCLI with a unique method of "screen-blanking". I won't say more, just try it!V.1.1, with source. by: Thomas Rokicki
Nag	A shareware appointment calendar with it's own editor and a unique 'nagging' feature utilizing the Amiga's voice and audio devices. V.1.6, binary only. by: Richard Lee Stockton
Perl	Practical Extraction and Report Language, an interpreted language optimized for scanning arbitrary text files, extracting information from those text files, & printing reports based on the information.by: Larry Wall
VRTest	Another anti-virus utility that allows visual inspection of ram starting a $7E7FE, ram cleaning, bootblock inspection and vector monitoring/ reseting. Written in assembly V. 3.2, binary only.by: Babar Khan
XBoot	Very simple utility to convert a boot block into an executable file to use your favorite debugger (Wack, Dis, etc.) to study it. withsource.by: Francois Rouaix

Fred Fish Disk 162

Avi	A workalike version of the UNIX vi editor for the amiga.Thoug not especially recommended for beginners, designed for those of you who may have the vi commands permanently hard-coded into your fingertips! V.1.0, binary only. by: Peter Nestor
CLI_Utilities	This directory contains several subdirectories with small utilities, collected from various sources, only usable from the CLI. Some with source. Author: Various
Dark	A small graphics and animation demo.withsource. by: Phil Robertson
Flow2Troff	A little utility to convert from New Horizons Software "FLOW" files to UNIX "troff" files, suitable for printing on any troff-compatible laser printer. V. 1.0, includes source and a sample "FLOW" file. by: Daniel Barrett
LabyrinthII	A shareware role-playing text adventure game similar in operation to the Infocom text adventures.Includes source. by: Russell Wallace
Iffar	Maintains archives of Interchange File Format (IFF) FORM CAT and LIST files in a manner that complies with the IFF CAT specification. V.1.2, includes source by: Karl Lehenbauer
SetPALorNTSC	A couple of utility programs for testing the suitability of a developed program in either the PAL or NTSC environments. Includes source and a sample program.by: Peter Kittel
TES	"The Electronic Slave" adds a gadget strip to the top of he cli window to perform such functions as device directories info, run ED, and time. Currently, assignments are hardcoded but not difficult to change if you own a compiler. V. 1.1, with source.by: Joerg Anslik
UnknownGirl	Amall musical piece similar in execution to Synthemania" on FF153. Binary only. byHolger Lubitz

Fred Fish Disk 163.

Bankn	A complete shareware checkbook system. Update to FF120. V1.5, binary . by: Hal Carter
FiveInLine	Board-playing game similiar to Go-Moku, Ristinolla, etc. Fast-paced & addictive! Source. by: Njel Fisketjxn
MachII	A "mouse accelerator" program which includes hotkeys, the features of sun mouse, clicktofront, popcli, title bar clock with a bbs online charge accumulator, and more. Update to FF130. V2.4c, binary only. by: Brian Moats
MemTrace	Routines help debug memory allocation and freeing during program development. Complains if you try to free memory you didn't allocate & reports on memory not freed when your prog finishes. by: Jojo Wesener
PcPatch	Patches for PCCopy and PCFormat from the 'EXTRAS 1.2' disk, to allow reading/writing/formatting 3.5 inch 360k (2 sides/ 40 Tracks/9 sectors) MS-DOS disks. by: Werner Guenther
ReadmeMaster	A nifty little database for finding those programs that you know exist somewhere (???) in the AmigaLibDisk library. Maintains a key-word dictionary of the Contents descriptions that allows searching by disk number, program title, author's name, or some other descriptive word. Currently supports disks 1-154 with planned updates. Binary by: Harold Morash
View	A mouse-oriented text file reader. Sample operation is demonstrated in reading the View.doc file, instead of using the usual "Less" text file reader. by: Bryan Ford

Fred Fish Disk 164.

C-Functions	A group of four little C-functions to add to your library to make your programming life a little easier. Includes source and a small demo program showing some of the results. by: Lars Thuring
DiskSalv	Very useful program to recover files from a trashed AmigaDOS disk. Can also "undelete" files deleted by mistake, so long as they have not overwritten by further disk activity. Requires two disk drives. Many enhancements since the original version on disk #20. Version 1.3, Binary only by: Dave Haynie
Hed	A handy little editor that is more user-friendly than "Ed", yet doesn't require the memorization of complicated keystrokes of some of the larger, more powerful, editors. Binary only. by: Hal Carter
Newton	Uses the "Newtons Method" algorithm to estimate both real and imaginary roots of a polynomial of degree 20 or less. Version 1.0, includes source. by: Daniel Barrett
NewZAP	A third-generation multi-purpose file sector editing utility, from the author of FileZAP. Displays and edits full 512-byte sectors via a 106 character wide internal font. Includes a search feature to find specific strings or hex digits, forwards or backwards. Update to FF#58. Version 3.18, Binary only. by: John Hodgson
PcView	Provides the PC community with the opportunity to display IFF pictures to the best of EGA's ability. Displays Amiga pics, IBM-PC Deluxe Paint Pics, Apple II-GS Deluxe Paint Pics, and others in the IFF standard format. Includes source. Author: John Hodgson
PolyRoot	Another Polynomial root-finder using the Newtonian algorithm. Nicely done in AmigaBasic with good documentation file. Version 2.00. Author: Jon Giorgini
PrtDrivers	A couple of new Printer Drivers. Digital Equipment's LN03+ laser printer, Mannesmann Tally's MT420d dot matrix. Authors: DEC LN03 — Bernie Mentink MT420d — Sascha Wildner
Zoo	A file archiver, much like "arc" in concept, but different in implementation and user interface details. Includes some nice features that "arc" lacks (such as file/path names up to 255 characters in length). This is version 2.00, an update to FF 136. Binary only. by: Rahul Dhesi, Amiga port by Brian Waters

Fred Fish Disk 165.

Conman	Extremely useful replacement for the standard console handler, provides line editing and command line histories. Completely transparent to any application program that uses CON: windows. Shareware, and well worth a donation to the author. V1.3, binary only, update to FF133. by: William Hawes
CPM	Another CP/M emulator independently authored from the version that appeared on disk #157. Emulates a CPM computer with a Z80 processor connected to an ADM3A terminal. Assembly source included. by: Ulf Nordquist
Parsnag	A program to aid in performing color separations on Epson JX-80 printers. Source. by: John Hodgson
PlotView	A couple of programs, Plotview and Plot2Am, for viewing UNIX plot files. Also included are two sub-directories: Plot — a device independent plotting package for the Amiga, compatible with the UNIX plot subroutine package and Plot2Tek — converts UNIX plot format files to Tektronix 410x terminal graphic commands. Source included. Author: Joel Swank
RamCopy	A copy program designed for machines with 1 meg or more of Ram and only one disk drive. Copy a complete disk in only one pass. by: Stephen Gunn
SPUDclock	A simple program that uses the narrator device to speak the time at certain user specified intervals. Lots of command line options. Version 1.2, includes source. Authors: Robert E. Beaty and H. Bret Young

Fred Fish Disk 166.

AutoGraf	Collects and graphically displays information on auto mileage. Features such as miles per gallon, cost per mile, miles driven, highs, lows, averages, etc. Includes sample data file, a couple utility programs and source. Version 1.0 Author: Joel Swank
Cref	C cross referencer program. Prints out your code with line-numbers and complete key-word cross-referencing. Update fto ff#103 which had a serious bug. Includes source. by: Mike Edmonds; Amiga port by Joel Swank
MultiCalc	Yet another RPN type graphic calculator. This one generates answers with extreme precision (if 3000 digits is enough!) Features a 48-digit scrollable display, mouse driven with lots of keyboard shortcuts, & iconification during non-use. Binary . by Ken Johnson
Stevie	A public domain clone of the UNIX 'vi' editor. Supports window-sizing, arrow keys, and the help key. Version 3.10a, includes source. Amiga port by Tony Andrews

Fred Fish Disk 167.

CDecl	English to C (and vice versa) translator for C declarations. This little gem will translate english such as "declare foo as pointer to function returning pointer to array 10 of pointer to long" into "long *(*(*foo)())[10]", and vice versa. Update to FF114. Includes source. by: Graham Ross with enhancements by David Wolverton, Tony Hansen, Merlyn LeRoy, Udi Finkelstein & more.
CLIcon	Run CLI programs from workbench, similar in operation to IconExec, but more versatile. by: Bryan Ford
CloseMe	Another ingenious perversion in the screen hack category. Don't miss this one...surely destined to become a classic! Includes source. by: Charlie Gibbs
DSM	(Dynamic Sound Machine) Demo version with "Save" disabled of a program which will take any IFF sound or raw data and save it as a totally self-contained, runable program. by: Foster Hall
MRPrint	A cli-based text file printing utility with lots of nice features, including tab-to-space expansion, page headers, line numbers, margin control with line-splitting and pagination correction, ARP wildcard support, and auto- rejection of files containing binary characters. Version 3.1, Includes source. Author: Mark Rinfret
Smus3.6a	An enhanced version of the smus player that last appeared on FF58 Author: John Hodgson
Sounddemos	Some very nice demos for showing off the incredible audio power of the Amiga!. 100% assembly language, Connect the stereo for these! Author: Foster Hall

Fred Fish Disk 168.*

Fred Fish Disk 169.*

* Fred Fish 168 and Fred Fish 169 contain and programs submitted by Matt Dillionmust be purchased at the same time to utilize the programs on the disk. In order to maintain the congruity of Matt Dillion's files, Fred kept the disks in their original form. We apologize for this inconvienence, but we feel the library should remain intact under Fred's original guide lines.

CONFIG V1.00	Configure friendly programs like DME for the initial window placement (configs the executable) by MDillion
Clock V1.00	Simple clock, configurable with config by MDillion.
DME V1.31	My programming oriented editor by MDillion
DMouse V1.10	Mouse enhancer .. acceleration, blanking, etc...(now handles requesters better w/ auto-activate) by M Dillion
Backup V2.01	HD backup/restore by M Dillion
SUPLIB	Support (link time) library required to compile Matt Dillion's programs. by M Dillion
LIBREF	Utility for generating run-time library link library assembly files, lvo.asm, & the run-time library's vector list. Currently very Aztec in what it generates. by MDillion
DRES V1	Support (run time) library w/ lots of functions including a generic parser and IPC. by Matt Dillion
DASM V2.11	Small-systems assembler. Handles 6502 and some of the Motorola single chip microcomputers. Generates code (not object module oriented). by Matt Dillion
FTOHEX	Part of DASM used to convert a DASM executable into an intel-hex formatted ascii file. by Matt Dillon
FILES V1.2	Matt Dillion's disk catalog program. by MDillion
SHELL V2.10	Added enviroment variable support and more. Use ConMan if you want command line editing by MDillion
FINDIT V1.00	Search for a filename (wildcard) by MDillion
LIBS V1.00	list libraries/devices in ram or attempt to remove libraries. by MDillion
SCAT V1.00	Utility to 'cat' binaries without blowing up the display by MDillion
ADDCR V1.00	Utility to add CR's before LF's in files by MDillion
REMCR V1.00	Utility to remove CR's in files by MDillion
CMP V1.00	Utility to compare two files by MDillion

Fred Fish Disk 170.

Aftterm	Commmunications program utilizing IBM 3278 terminal emulation. Binary only. by: Don Brereton
Dis6502	A ported 6502 disassembler with support added for C64 binary files. Includes source. by: Robert Bond, Amiga port by Udi Finkelstein
FastText	Blitter based fast text rendering routines written in assembly. Unique in the fact that they speed up rendering of non-proportional fonts of any height, and from 4-16 pixels in width. Source and test program included. by: Darren M. Greenwald
MRBackUp	A hard disk backup utility that does a file by file copy to standard AmigaDOS floppy disks. Includes an intuition interface and file compression. Version 2.4, Update to FF129. Binary only by: Mark Rinfret
PtrAnim	Nifty pointer animation program, includes lots of samples, a utility program and instructions on creating your own animations. Binary only, shareware by: Tim Kemp
Surf	Generates bezier surfaces of revolution. Will produce some amazing pictures of wineglasses, doorknobs, or other objects one could turn on a lathe. Includes the capacity to map IFF image files onto any surface that it can draw. Source included by: Eric Davies
Turbo	Opens a small window with a gadget that when selected, turns off bitplane, sprite, copper and audio DMA, to increase system speed. Source. by: Oliver Wagner

Fred Fish Disk 171.

AZComm	Modified version of Comm 1.34 that contains Zmodem send, receive, and resume receive. Version 1.00, Binary only. by: SS. Patel, based on Comm 1.34 by DJ James
Maze	A couple of very nice demos for the creation and use of single-solution mazes, one of which is practically a stand-alone game. Includes source. by: Werner Gunther
Sozobon-C	Atari ST version of what appears to be a full K&R freeware C-compiler, assembler and linker. The compiler main pass and the assembler were compiled and tested on an Amiga A2000 with only minimal changes, and they appear to work (to the extent that they believe they are running on an Atari-ST), so an Amiga port should be relatively easy. by: Sozobon, Limited.
Xoper	Very comprehensive program to monitor and control system activity. Monitor cpu, memory usage, ports, interrupts, devices. Close windows, screens, show loaded fonts or last Guru code number. Clean up memory, flush unused libraries, devices, fonts. etc. and a whole bunch more! Spawns its own process. A very handy background task to have loaded. Assembly source included. by: Werner Gunther

Fred Fish Disk 172.

DataToObj	A utility to convert raw data files (sprites, image data, text, etc.) directly into object code which can then be linked to the main program without the need to go through the compiling process. Includes source. by: Werner Gunther
Handshake	A full featured VT52/VT100/VT102/VT220 terminal emulator. he author has taken great pains to support the full VT102 spec. Now supports ANSI colors, screen capture and more. Update to version on FF60. Version 2.12a, binary only, shareware. by: Eric Haberfellner
MFix	Small program to insert in the startup-sequence of the commercial program, Marauder II, from Discovery Software, International. When the copy process starts, the rainbow screen is covered by a bare screen until the copy is finished. Author claims a 25% decrease in copy time is achieved. V1.0, Binary. by: Stephen Gunn
PopInfo	A "shrinkable" workbench utility to show you some info Workbench doesn't, such as free memory on external devices, chip, fast, and total ram usage and more. V2.0, Includes source. by: Jonathan Potter
ProCalc	Simulates an HP-11C programmable calculator. Lots of enhancements and bug fixes since the original version on FF139. V1.2, binary only, shareware by: Gotz Muller
Spiff	Make controlled approximations between two files. Similar to "diff" but more versatile. Allows for the handling of numerals as string literals or numeric values with adjustable tolerances. Provides for embedded commands, scriptfiles, and many other command-line parameters. Potentially very useful, needs some Amiga-specific work. Source and example files included by: Dan Nachbar, Bell Communications Research (BELLCORE)

Fred Fish Disk 173

CrcLists	Complete CRC check files for disks 146-172 using the crc program from disk 133. These were made directly from FF masters Author: Fred Fish
FileSelect	A FileIO selector, written 100% in assembly. V1.0, includes source Author: Fabrice Lienhardt
IffLib	Ready-to-use library to perform various manipulations on IFF files. Includes a sample IFF viewer and a utility to save the front screen as an IFF file.Author: Christian A. Weber
ILBM2C	Very useful utility for C-programmers. Reads in a standard IFF ILBM file and outputs a file that can be included in your program. Includes source and a sample program. Author: Tim Kemp
Tetrix	An addictive game of speed, skill and luck. Based on a game originally called Tetris. The object is to fit together oddly grouped falling blocks to create a solid wall, which is then cleared from the bottom up. Sounds simple enough right? Sure...! Shareware, Version 1.1, Binary only. Author: David Corbin
Uedit	Version 2.4g of this nice shareware editor. Has learn mode, a command language, menu customization, and other user configurability and customizability features. Binary only, shareware, update to FF121. Author: Rick Stiles

Fred Fish Disk 174

Castle	A simple graphics adventure game suitable for beginners. Binary only. Source available with a small donation to the author. Author: H. James Fox
Iff2Sun	A small utility for those of you who may have access to a Sun workstation. Takes an Amiga IFF file and converts it to a Sun rasterfile format. Source only, as the program needs to be re-compiled and run from a Sun. Authors: Steve Berry, Mark Thompson

Print1.2	CLI-based printing utility with several nice features including the ability to print in ASCII or HEX, with or without line numbers and a CTRL-C Trap. Includes source. Author: John F. Zacharias
Sh	Another version of the 'Sh' utility to unshar shell archives. Apparently corrects some problems encountered by similar programs. Until we can get everybody using some sort of "standard", perhaps if we collect enough of these utilities, we will eventually find one that works with the particular archive we're trying to unshar! Includes source. Author: Jim Guilford
Strings	A simple utility with command-line options for locating strings in a binary file. V1.0, includes source. Author: Joel Swank
TitlePage	Prints banner-type title pages for identifying listings. Lots of command-line options for specifying various fonts, pitches, typestyles, selectable centering, etc. Includes source. Author: Joel Swank
Tunnel	An interesting graphics demo written in TDI-Modula 2. I suggest you don't stare at this too long! Includes source. Author: Garth Thornton

Fred Fish Disk 175

Elements	Very nice interactive display of the the Periodic Table of Elements. Can display a large amount of pertinent data about a selected element along with a good deal of general and miscellaneous info. Author: Paul Thomas Miller
Furnish	For those of you who may have ever used the "scale size cut and place" method of determining your next living-room arrangement, this Amiga-ized version may be just what you need. Binary only, shareware. Author: Terry Gintz
Plot	Program to compute and plot 3 dimensional functions. Major revision to PD version on FF49 . V4.1, binary only, shareware. By: Terry Gintz
SafeBoot	Very handy intuition-based program to read and save custom bootblocks. The bootblock can then be later restored should the disk become virus-infected. V2.2, binary only. Author: Mark Lanoux
SendMorse	Brush up on your morse code with this simple program that will read an input textfile and output the characters at an adjustable rate. By: Joe Larson
VirusX	V 3.10 of the popular virus detection/vaccination program. Features a test for the new IRQ virus, among others, and a new "Kill Virus" utility. Includes source. Author: Steve Tibbett
WBDepth	CLI program that allows you to change the number of bitplanes for the WB screen on the fly. Very useful for A500 and A2000 users with kickstart in ROM. Binary only. By: Andry Rachmat
Zippy	A "Graphical Shell". Opens a medium-size window and attaches a menu-strip for performing all sort of disk/data manipulations. Features script files allowing you to attach custom menu selections as you move between directories. Also included is an intuition based utility for altering FileInfo data. (filename, filenote, RWED attributes, etc.) V 2.5, binary only. By: MWeiblen

Fred Fish Disk 176

AnalytiCalc	V23-2A of Glenn Everhart's large and powerful spreadsheet program called AnalytiCalc, submitted to me directly by Glenn for inclusion in the library an update to FF144. AnalytiCalc is presented in entirely ZOOed form because it could not otherwise fit on a single disk. With this release, AnalytiCalc has become "Freeware" rather than "Shareware". Thus the only restrictions on AnalytiCalc code are that derivative programs remain freely distributable.
HyperNet	HyperNet is a small hypertext shell program for Amiga, presented with sources and brief documents. . HyperNet allows a "master" AmigaDos process to control a series of connected processes, where the connections are randomly ordered directed graphs. Permissible "child" processes available at any stage are governed by the links of the graph. The implementation is mainly instructive, but can be used for tutorials or demonstrations and illustrates the simplicity of hypertext concepts on a multi-tasking system. Author Glenn Everhart

Fred Fish Disk 177

ASpice	A version of the SPICE 2G.6 circuit analysis program which has been modified to run in the Amiga environment. The program arrays are adjusted to require one forth the memory of the DEC VAX version. Although this does not usually put much of a constraint on circuit analysis, some users who are used to the full mainframe environment may have to be more aware of the memory demands of their analysis. Requires a minimum of 1.5 MB memory. This version neither supports nor requires the 68020 processor or 68881 coprocessor. Binary only. By Many
DiskSalv	V1.32 of the popular "undelete" and file recovery program. Fixes a few bugs apparently found on the V1.3 on FF164. Author: Dave Haynie
Jask	An intuition-based replacement for the ASK command. Will bring up a requester with a message and boolean yes/no type gadgets. V 1.0, includes source. Author: John Barshinger
Marge	A simple CLI utility to add a specified number of spaces or tabs to the left side of every line in a file. Includes source. Author: Joel Swank
Path	An interesting concept in path-searching. This program contains a path-handler that allows you to selectively control or assign your system's search path using script files. Includes source. By: Rico Mariani

Fred Fish Disk 178

AmicForm	Creates a phonebook containing only those areacodes and exchanges reachable through PC-Pursuit. Update to FF157. Works with the new Finalist BBS format. V1.4, Binary only. By: John Motsinger
BlackBox	The black box is an 8x8 grid in which several "atoms" are hidden. Your job is to find the atoms. You have at your disposal a ray projector which you can use to send rays into the box from any of the 32 spots around the box. Binary only. Author: Tim Kemp
CIATimer	Two versions of ciatimer routines to provide precise timing for applications requiring a high-accuracy real-time clock. Includes source and a sample executable. Author: Karl Lehenbauer, based on the original version by Paul Higginbottom
Cosmic	An interstellar multiplayer game of War and Peace. From the looks of the documentation file, it appears fairly extensive! V1.01, includes source. By: Carl Edman
Ls	V2.0 of the popular UNIX style directory lister. Revised for Lattice 5.0 and made 1.3 compatible. Includes source. Author: Justin V. McCormick.
RemLib	Removes a specified library (if currently unused) or displays some information about all available libraries. Update to FF139. V1.11, includes source in assembler. Author: Heiko Rath
RexxArpLib	V2.0 of the rexxarplib.library, which has grown considerably, with substantial intuition interface support. Also included is a large number of ARexx macros. Author: W.G.J. Langeveld

Fred Fish Disk 179

DietAid	Diet planning aid to allow the user to compile lists of ingredients (recipes) and automatically compute calorie totals, etc. Update FF36. V3.1, binary only. by Terry Gintz
Dmake	Beta release of Matt's version of the UNIX make utility. Features multiple dependancies, wildcard support, and more. Includes source. By Matt Dillion
Excption	Exception is a set of error handling routines that provide a programmer with the ability to easily handle often difficult to implement routines. Routines such as no more memory, file not open, read/write error....etc. V0.6, includes source. By Gerald T Hewes
KickFont	For A-1000 owners, will permanently replace the topaz font on the kickstart disk with a font called "look". Includes a sample in the form of an IFF picture. V3.0, binary only. Also included is Benjamin Fuller's freely redistributable 'SumKick' program. By Greg Browne
Launch	Sample program showing how you can load and execute a program in the workbench environment, then return to the CLI. Includes source. By Peter da Silva
Regexp	A nearly-public-domain reimplementation of the V8 regexp(3) package. Gives C programs the ability to use egrep-style regular expressions, and does it in a much cleaner fashion than the analogous routines in SysV. Includes source. By Henry Spencer
TSnip	Very nice "cut and paste" type utility with lots of uses and functions. Features a pop-up intuition control panel, multiple font and color recognition, clipboard and pipe support and a couple of utility programs. V1.4a, source for support programs only. By John Russell
UnixUtil	A few CLI utilities, including some functionally similiar to the UNIX utilities of the same names. Included are: Wc, Head, Tail, Tee, Detab, Entab, and Trunc. Descriptions are given in the included '.doc' files. By Gary Brant

Fred Fish Disk180

Browser	A programmer's "Workbench". Allows you to easily and conveniently move, copy, rename, and delete files & directories from a CLI environment. Also provides a method to execute either Workbench or CLI programs. V1.6, update to FF134, binary only. By Peter da Silva
GeoTime	A couple of interesting "clock" type programs based on the "Geochron". Observe the earth's shadow scroll across a map or globe in real-time, based on the system clock. V1.0, binary only, shareware. By Mike Smithwick
GPrint	A black & white graphics print utility for Epson compatible printers. Command-line options allow several different print qualities and densities. Includes a couple of sample IFF files for printing. V2.03, binary only, shareware. By Peter Cherna
Jed	A nicely done, intuition-based editor that is quite user-friendly. Features word-wrap, auto-indent, newcli, alt buffer, split-window, keyboard macro, help, printing, and more. V1.0, binary only, shareware. By Dan Burris
NoVirus	Another Anti-Virus utility. This one features known and new virus detection, view boot block, save and restore bootblocks, several "install" options and more. Written in assembly. V1.56, binary only. By Nic Wilson
RepString	Nice little CLI utility to replace any type of string in any type of file with another string of any type. V1.0, binary only, shareware. By Luciano Bertato
TrekTrivia	Very nice mouse-driven trivia type program for Star Trek fans. Contains 100 questions with additional trivia disks available from the author. Binary only, shareware. By George Broussard

Fred Fish Disk 181

AMXLISP	Amiga-ized version of the XLisp interpreter originally by David Betz. V2.00, includes source. By David Betz; Amiga work by Francois Rouaix
Bally	Amiga port of the former arcade game named Click. Lacks sound effects,promised for later updates. V0.1, binary only, shareware. By Oliver Wagner
Tracker	Useful debugging routines similar in function but more versatile to those of "MemTrace" on FF163. Will track and report on calls to AllocMem(), FreeMem() [or lack thereof!] among others. V0.0a (Alpha release). By Karl Lehenbauer

Fred Fish Disk 182

AMC	"Amiga Message Center". Scrolls a message from a text file across the screen on a colorful background. Similar to the "greetings" programs developed by European Amiga enthusiasts. V1.0, binary only. By Foster Hall
Edimap	A keymap editor. Allows you to read in an existing keymap file, modify it to suit your needs, and save it as a ready-to-use keymap. V1.0, includes source. Author: Gilles Gamesh
HR136	An IFF file containing a chart showing every possible mixture of the sixteen basic palette colors. Also included are optimized and monochrome palettes along with several tips and techniques for using them with various paint programs.By Dick Bourne
Iconmerger	Intuition-based program to take any two brush files and merge them into an alternate-image type icon. V2.0, binary only. By Terry Gintz
Sam	Another IFF sound player with several command-line options. Includes several samples. V1.0, binary only. By Nic Wilson
SetFont	Allows you to change the system font with various command-line options. Cleans up all known bugs in FF75. V2.5, includes source in C++. By Dave Haynie

Fred Fish Disk 183

FixFd	A utility for Amiga assembly programmers. FixFd will read a '.FD' file and output a file that can be 'INCLUDE'ed rather than having to link with the colossal 'Amiga.Lib'. V1.0, includes source in assembly. By Peter Wyspianski
Mklib	Another example of building a shared library that evolved from "Elib" FF87. Also included is a library, Edlib, which contains several functions not included in the Manx standard libraries. Includes source. By Edwin Hoogerbeets with C-functions from several different authors
PCQ	A subset implementation of a freely-redistributable Pascal compiler. Supports include files, external references, records, enumerated types, pointers, arrays, strings and more. Presently does not support range types, the 'with' statement or sets. V1.0, includes source and sample programs. By Patrick Quaid

Fred Fish Disk 184

BI	A small brush to to C-code image converter, intended to be used from CLI. V1.0, binary only. By Terry Gintz
CardMaker	A programmer's aid for creating card image data that can be used in any card game that uses the standard 52 card deck. V1.0, binary only. By Terry Gintz
DPS	Demo version of a program that will allow you to take any IFF file and save it as a totally self-contained executable file, without the need for any IFF-viewers. V1.0, binary only. By Foster Hall
MouseUtil	Intuition based program to allow you to change your mouse speed without having to go through preferences. V1.1, includes assembly source. By Luciano Bertato
Print	Small print utility designed to replace the "copy <filename> to prt:" command. Opens a window displaying the filename being printed, length, and a status bar showing percent completed. Also includes an abort gadget. V1.0, binary only. By Luciano Bertato
VacBench	This amusing little screen hack will "clean up" your WorkBench screen for you when it gets too cluttered! Binary only. By Randy Jouett
World	A text adventure game similar to the Infocom adventures of Planetfall and Starcross. Quite large with a tremendous variety of responses. V1.02, includes source. By Doug Mcdonald, Amiga port by Eric Kennedy

Fred Fish Disk 185

Commodore IFF	This is a copy of the official November 1988 Commodore IFF disk. All the files in the "documents" directory are in zoo file "documents.zoo"

Fred Fish Disk 186

A68k	A 68000 assembler originally written in Modula-2 in 1985 and converted to C by Charlie Gibb in 1987. Has been converted to accept metacomco-compatible assembler source code and to generate Amiga objects. Includes source. This is V2.42, an update to FF110. By Brian Anderson; C translation and Amiga work by Charlie Gibb
Cards'O'Rama	A simple game that let's you push your memory. It is played with a deck of 32 cards, grouped in 16 pairs. The cards are shuffled and then displayed at the beginning of each game. Your goal is to pick up as many pairs as you can, until there are no cards left on the screen. V1.0, includes source. By Werther Pirani
Qt2	A cute program that gives the time the way many people actually do, I.E. "it's nearly ten to five". Includes source in assembly. By Charlie Gibb
SimCPM	A CP/M simulator for the Amiga. Simulates an 8080 along with H19 terminal emulation. Includes source. This is V2.3, an update to FF109. By Jim Cathey; Amiga port by Charlie Gibbs and Willi Kusche

Fred Fish Disk 187

Diskperf	A disk benchmark program which runs on both Unix and the Amiga. This is an update to FF48, with bug fixes and more reliable measurements of the faster read and write speeds available under the new Fast File System. By Rick Spanbauer, enhancements by Joanne Dow
HackLite	This is the latest version the Amiga port of Hack, with lots of Amiga specific enhancements and neat graphics. Now includes an easy to use installation program. This is HackLite V1.0.0, binary only. By Software Distillery
Mackie	A versatile cli/macro-key initiator based on POPCLI with a unique method of "screen-blanking". I won't say more, just try it! V 1.13, includes source. This is an update to FF161. By Tomas Rokicki
SetCPU	A program designed to allow the user to detect and modify various parameters related to 32 bit CPUs. Includes commands to enable or disable the text/data caches, switch on or off the '030 burst cache line fill request, use the MMU to run a ROM image from 32-bit memory, and to report various parameters when called from a script. V1.4, includes source. By Dave Haynie

Fred Fish Disk 188

BootIntro	This program creates a small intro on the bootblock of any disk, which will appear after you insert the disk for booting. The headline can be up to 20 characters. The scrolling text portion can be up to 225 characters. V1.0, binary only. By Roger Fischlin
DiffDir	Diffdir compares the contents of two directories, reporting on differences such as files present in only one directory, different modification dates, file flags, sizes, comments, etc. V1.0, includes source. By Mark Rinfret
ExecDis	A disassembler comment generator program for the 1.2 Kickstart ROM exec library image. Generates a commented disassembly of the exec library. V1.0, binary only. By Markus Wandel
FastGro	A fractal program, simulating Diffusion-Limited Aggregation (DLA) as described in the December 1988 Scientific American in the Computer Recreations column. This program is about an order of magnitude faster than the "SLO GRO" program described in Scientific American. V 1.0, includes source. By Doug Houck
FracGen	A fractal generator program that generates fractal pictures from "seeds" that you create. This is unlike any of the other "fractal generators" I've seen. It can be used to load and display previously created fractal pictures, modify existing fractals, or create your own fractals. V 1.23, binary only, update to FF142. By Doug Houck
MemoryClock	A clock program that shows the amount of free fast ram, free chip ram, as well as the time and date. Includes source in assembly code. By Roger Fischlin
MinRexx	A simple ARexx interface which can be easily patched into almost any program. Includes as an example the freedraw program from FF1. Includes source. By Tomas Rokicki
Null	A new dos device that behaves like "NIL:" but unlike "NIL:", it is a real handler. This makes it useful in lots of situations where "NIL:" cannot be used. V 0.0, includes source. By Gunnar Nordmark
TextDisplay	A text display program, like "more" or "less", but about half the size and handles all screen formats (pal/ntsc, interlace/non-interlace, etc). V 1.1, binary only. By Roger Fischlin

To Be Continued......

In Conclusion

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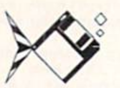

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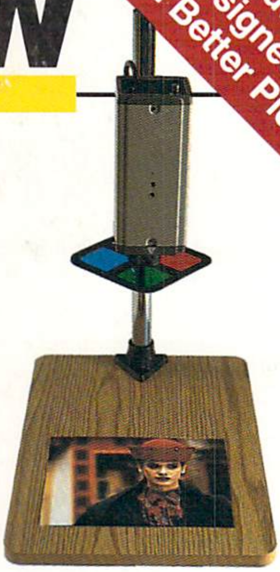

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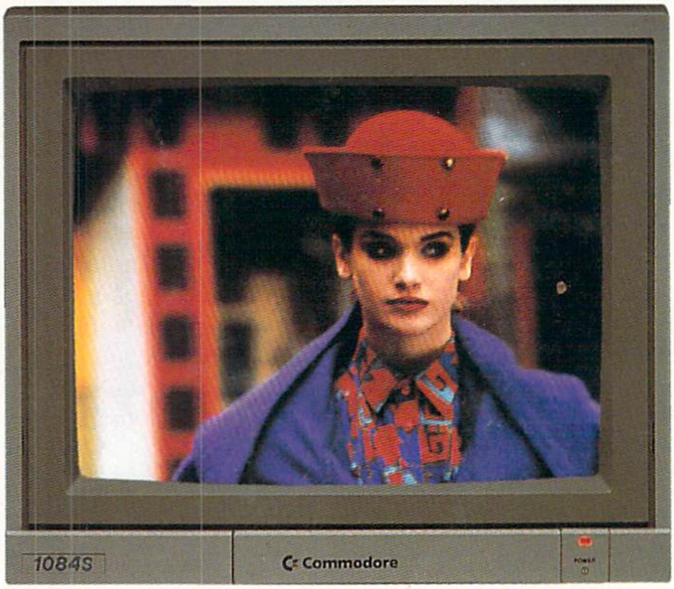

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